COTTON

Volume LXXXI
Number Ten
Ten Cents a Copy

AUGUST, 1917

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Dalton, and Atlanta, Ga.

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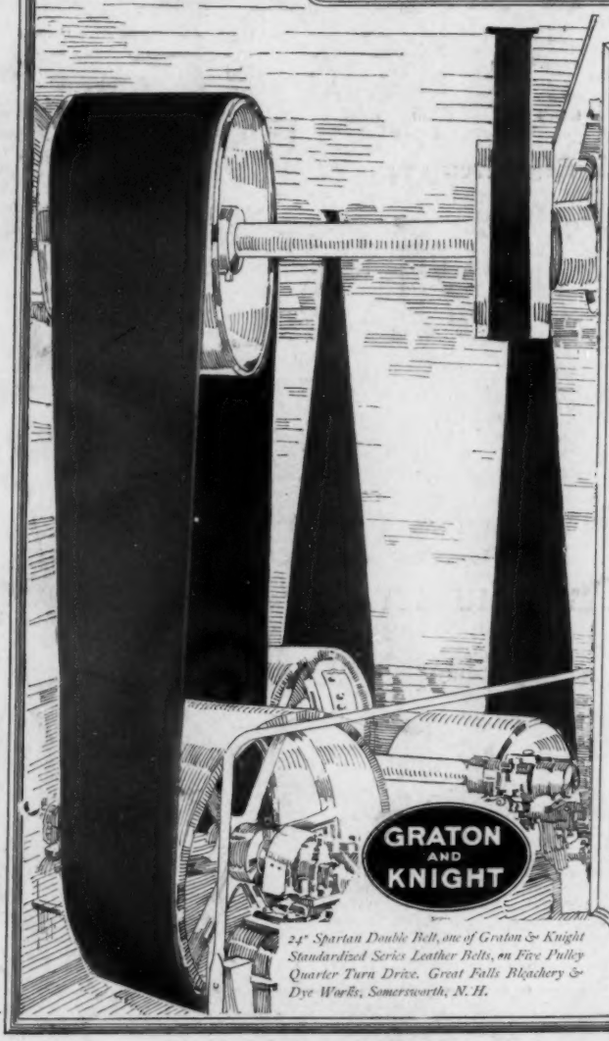
PERIODICAL DIVISION

GRATON & KNIGHT

Standardized Series

LEATHER BELTING

Tanned by us for belting use



24" Spartan Double Belt, one of Graton & Knight Standardized Series Leather Belts, on Five Pulley Quarter Turn Drive. Great Falls Bleachery & Dye Works, Somersworth, N. H.

It Begins in the Tannery

Leather is the standard belting material.

To us, the largest belting makers in the world, every possible belting material lies open for selection and use. But the belting experience of generations points to the unescapable fact that leather has the properties necessary to make good belting.

Leather that is properly tanned for belting is tough, flexible, durable and prehensile. It preserves the natural softness and mobility of the skin, ensuring an effective grip on the pulley surface.

We have standardized these requirements of perfectly tanned belt leather. The standard in each case is the highest *working* efficiency in the finished belt.

Since the market cannot supply tanned belt leather that continuously measures up to Graton & Knight Standards, we tan our own hides. Last year, we tanned 285,000 of them, in our own tannery. We tanned them for *belts*. We tanned them to definite and uniform standards of belting requirements.

This standardization of material is the foundation of Graton & Knight quality.

It makes the Standardization of Graton & Knight Belts an actual, practical thing.

Think what other standardized products have done for you—and consider the standardization of belting on that basis. Let us send you complete information on the subject.

The Graton & Knight Mfg. Company

Oak Leather Tanners, and Makers of Leather Belting

Worcester, Massachusetts, U. S. A.

BRANCHES

Atlanta	Detroit	New Orleans	Portland, Ore.
Boston	Fall River	New York	St. Louis
Chicago	Kansas City	Philadelphia	Seattle
Cleveland	Minneapolis	Pittsburgh	Leicester, England

SELLING AGENTS

Graton & Knight Mfg. Co., of Texas, Dallas, Texas.
Graton & Knight Mfg. Co. of Wisconsin, Milwaukee, Wis.
Graton & Knight Mfg. Co. of California, San Francisco, Cal.

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COTTON GOODS

That can be woven with one shuttle can and should be woven on

NORTHROP

Trade-Mark Registered

LOOMS

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

Southern Office
188 South Forsyth Street Atlanta Georgia

Copyright 1916 by Draper Company

DRAPER CORPORATION

Northrop Loom

Repairs

FIT

Northrop Looms

TRADE-MARK REGISTERED

MADE BY

DRAPER CORPORATION

Hopedale Massachusetts

Southern Office

188 South Forsyth Street Atlanta Georgia

Copyright 1916 by Draper Corporation

Copyright 1916 by Draper Company

"DIXIELITE"

Time Has No Effect On "Dixielited" Walls and Ceilings

Have you noticed how Old Father Time changes those walls and ceilings coated with inferior oil-and-varnish white paints? Have you noticed how they yellow and peel and crack, and lose all value as a light-reflecting surface?

Old Father Time is very lenient with walls coated with "Dixielite."

"Dixielite" is not an imitation of anyone's mill white. It's a *PERFECTED* mill white that has behind it 65 years of experience in paint making. You may have to pay a little more for it, but it's worth more to have a *lasting*, glossy-white, light-reflecting surface on your walls that is washable and sanitary. It's economical in the long run, and only one coat is needed over previously coated white walls.

On Cement or Brick surfaces use Bay State Brick and Cement Coating as a first coater for "Dixielite."

A sample of "Dixielite" sent free of charge for experimental purposes if interested. Demand "Dixielite" from your painting contractor. Send for sample panel today. Acquaint yourself with this superior Mill White. Different from the rest.

Wadsworth, Howland & Company, Inc.

139-141 Federal Street **Boston, Mass.**

Makers of the Bay State Brick and Cement Coating.

BAY STATE

SACO-LOWELL SHOPS

TEXTILE MACHINERY

INCLUDING

ROVING FRAMES
OF
IMPROVED DESIGN
AND
CONSTRUCTION
SLUBBER FRAMES
INTERMEDIATES
FINE FRAMES AND
JACK FRAMES

SHOPS

BIDDEFORD, ME. LOWELL, MASS. NEWTON UPPER FALLS, MASS.

EXECUTIVE OFFICES

BOSTON, MASS.

ROGERS W. DAVIS, Southern Agent, CHARLOTTE, N. C.

"IDEAL"

AUTOMATIC LOOM

Saves 50% to 60% in Weaving Costs

Its breakage and repair expenses are very low due to the fact that every movement is smooth and thoroughly mechanical.

No special supplies, bobbins or shuttles are required enabling you to buy them where you please.

It weaves the highest grade of cloth ever produced upon an automatic loom.

It is the only automatic loom that can use cops or bobbins interchangeably.

It is the last word in modern weaving machinery.

Write for our catalog giving detailed mechanical description

"IDEAL"

The Stafford Company

Readville, Mass.

Southern Office: Charlotte, N. C.

"IDEAL"

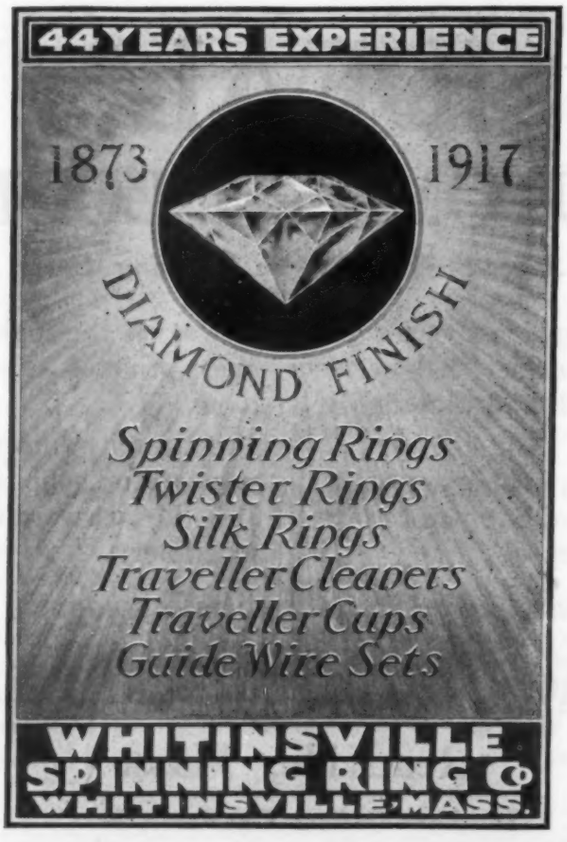
CROMPTON & KNOWLES LOOM WORKS

LOOMS

WORCESTER, MASS.

PROVIDENCE, R. I. **PHILADELPHIA, PA.**

Alexander & Garsed, Charlotte, N. C., Southern Representatives.



B. S. ROY & SON CO.

ESTABLISHED 1868

The only firm in the world exclusively devoted to building and improving grinding machinery for textile mills.

WORCESTER, MASS.

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

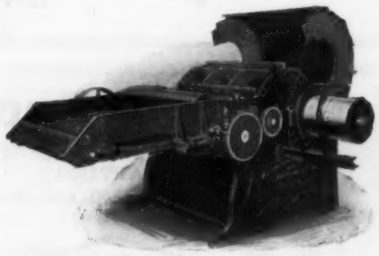
Middletown, - - - Connecticut.

SMITH & FURBUSH

MACHINE CO.

PHILADELPHIA, PENNA.

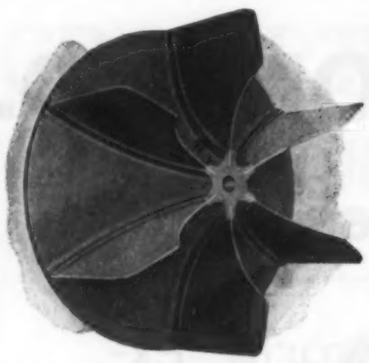
Specialists in machinery for working all kinds of Waste Products. Complete equipment for coarse yarns, etc., from waste. Shoddy, Felting and Woolen machinery.



Jute Picker

Send for Circular S82.

This machine is used for shredding or hackling out Gunny and Burlap bagging. It is used as a part of our outfit for the manufacture of gunny bagging from scrap bagging.



Here's the Fan Wheel

That Has Made These Reversible Fans So Universally Successful in Cotton Mills

This fan wheel is the secret of the success of our reversible fans for conveying Cotton, Wool, Rags and Stringy Material of any kind.

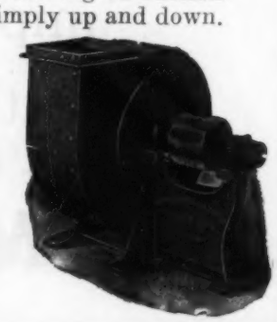
This fan wheel is constructed with a cone-shape back of cast iron with sheet steel blades cast solid. Note the short over-hang, which makes the fan run smoothly without vibration. This wheel offers less resistance to material passing through than any other wheel. It handles long, stringy material just as good as short material or lint.

And it's reversible.

The fan is built solid and runs without a tremor at maximum speed. No buckling of suction at high speed. No rivets to work loose. Universal adjustment of bearings, not simply up and down.

Made in any size, from 30 inch to 60 inch.

Folder R. F. explains fully. Ask for it today. Our catalogs Nos. 65 and 67 show our complete line of fans and blowers for every class of work.



BUILT RIGHT RUN RIGHT

The New York Blower Co.

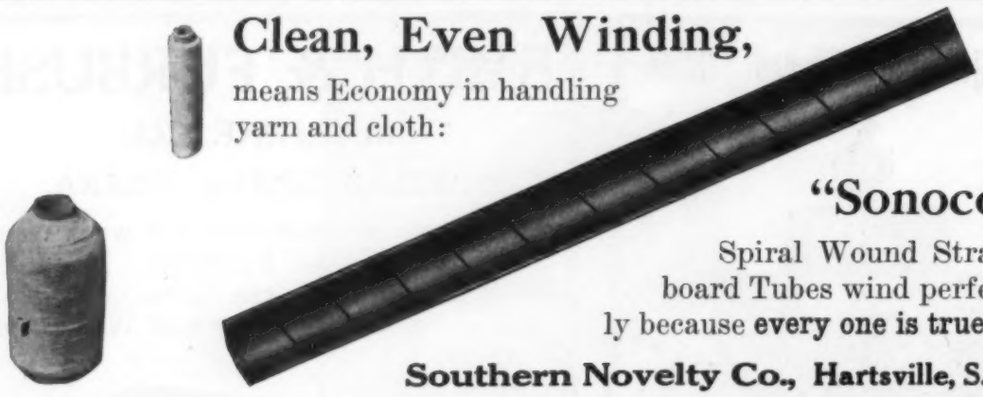
Main Office: Archer Ave., and Canal Street, CHICAGO, ILL.

Works: BUCYRUS, OHIO.

Leader-News Bldg. Cleveland, O. | Ridge Arcade Bldg., Kansas City, Mo. | 502 Plymouth Bldg., Minneapolis, Minn. | 303 B. F. Jones Bldg. Pittsburgh, Pa. | 12 Railroad Place, East Orange, N. J.

Clean, Even Winding,

means Economy in handling yarn and cloth:



"Sonoco"

Spiral Wound Strawboard Tubes wind perfectly because **every one is true:**

Southern Novelty Co., Hartsville, S. C.

Acme Supplies for the Shipping Room

Patent Coil Holder

ACME DOT EMBOSSED STRAPPING
In coils of 300 and 3000 feet.

ACME

ACME GALV. TWISTED WIRE STRAPPING.

MFRS. OF STEEL BOX STRAPPING
LACQ. & GALV. FINISHED BALE TIES
BUCKLES OF VARIOUS DESIGN

WRITE AT ONCE FOR NEW CATALOG.

No. 4 Acme Buckle

Mfd. By

ACME STEEL GOODS CO.

Works: CHICAGO.

Whse. and Offices at 10-14 Tift St., Atlanta, Ga.

ACME BALE TIES, LACQ. and GALV.

Necessaries for the Mill and Shipping Department

CARY'S EVERLASTING FLEXIBLE STEEL MAT

Has a Scraping Surface in Every Direction.
Practically Indestructible.

Rust-Proof Reinforced Edges

Sanitary Self-Cleaning

The U. S. Government has contracted for this Mat to be used in all its buildngs throughout the U. S.

Twelve Regular Stock Sizes. Special Sizes to Order.

CARY'S BALE BAND AND BUCKLE

Those Who Have Tried Them Say They Are the Best

The Above Shows a Bale of Cotton Securely Fastened by Our Bale Ties and Buckles. Note Its Neat and Compact Appearance.

The Buckle can be applied with the Locking or Hook part next to the Bale, so that there is no possibility of its getting caught in other Bales when piled together.

Also Manufacturers of
Twisted and Flat Wire Box Straps and a Full Line of Shippers' Specialties.

Cary Manufacturing Company, Manhattan Bridge Plaza BROOKLYN, N. Y.

Our new Self-Tightening Twisted Wire Strap. Nails can be driven anywhere

Assign Daily Tasks; Record Output; Reward Merit

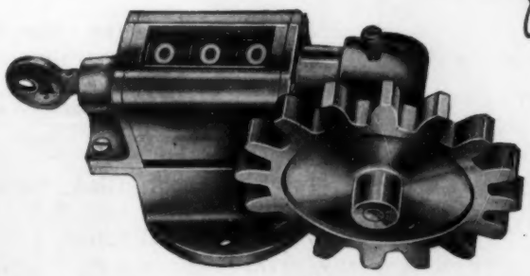
Give each operator an *object;* give him means of measuring his progress; give him incentive to exceed his quota—and production jumps!

That's been the experience of great textile mills which pay each operator for performing a given task—with a bonus for exceeding the requirements.

This method speeds up while satisfying all parties, for conjointly with increasing output for the employer it increases the wages of employees.

One leading plant has increased the output of its looms *7% to 8%* by assigning a daily task for each loom, and taking periodic readings from Loom Pick Counters. *The instruments used all bear the name—*

Veeder



This Loom Yardage Counter is intended to be driven from the sand roll, and accurately measures yardage of material passing over the roll. **Booklet will be sent showing complete line of counters for textile machinery.**

The Loom Pick Counter shown at right is designed especially for looms, and is driven from crank shaft. Furnished to indicate picks in either hundreds or thousands; reads in plain figures. Counter shown registers picks in thousands up to 100,000,000 picks—and repeats.

The Veeder Mfg. Co., 6 Sargeant St., Hartford, Conn.

SPAULDING TRADE Fibre MARK PRODUCTS

FIBRE RECEPTACLES

SPAULDING TRADE Fibre MARK PRODUCTS

SPAULDING FIBRE TRUCKS

Combine Lightness, Strength and Durability

Style C. Steel Clad Truck

Spaulding Steel Clad and Fibre Trucks, like all other receptacles bearing the Spaulding Trade Mark, are recognized by textile men throughout the country as perfection in this class of product.

They are made of the most superior quality of fibre, and steel reinforcements throughout protect the fibre from hard knocks. Their lightness, combined with utmost strength and durability, means less effort, and a saving of time and money.

Any size desired. For sale by all leading mill supply houses. Catalog and detailed information gladly sent on request.

Style A. Fibre Truck

J. SPAULDING & SONS CO., Rochester, N. H.

The Combination Doffing Car of Maximum Service

It's "Leatheroid"

Any size. Steel Clad if desired.
Can be ordered from your Mill Supply House.

Leatheroid Sales Co.

1024 Filbert Street, Philadelphia, Pa.

Selling Agents for the Leatheroid Co.

Prevent Your Waste and Broken Ends

BY USING

THE

"NO-WASTE"

Seamless Hard Fibre
ROVING CAN

It does not have the riveted seam that strains and breaks the sliver.

NO SEAMS OR RIVETS.
ABSOLUTELY SMOOTH.

ALSO

Fibre and Steel Clad Cars, Doffing Trucks and Mill Boxes of All Kinds.

SHEET FIBRE TUBES, RODS
Special Shapes.

STANDARD FIBRE COMPANY

25 Miller Street
SOMERVILLE, MASS.

Westinghouse

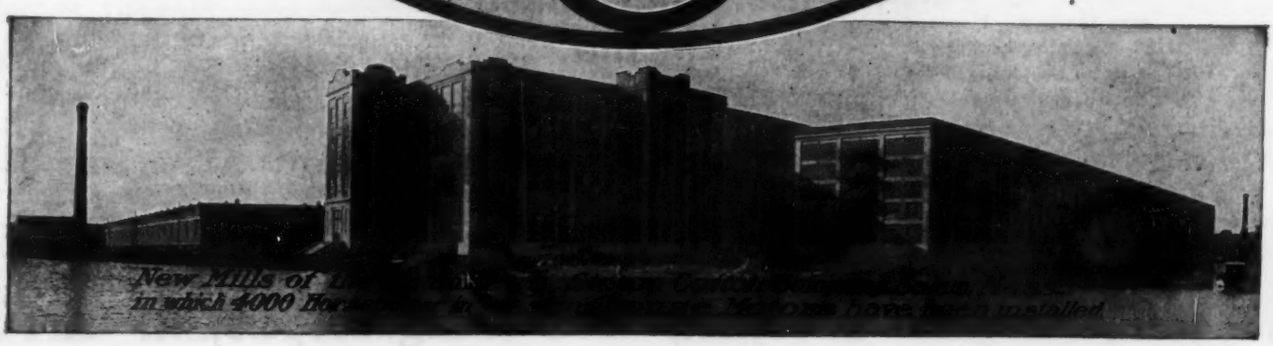
Complete Electrical Equipment for Textile Mills

Electricity is the best form of power for your mill. It is the most economic; Increases production; Improves quality; and betters working conditions.

Westinghouse Experts are prepared to give you the benefit of their experience in equipping your mill from steam supply to the driven machine.

Westinghouse Electric & Manufacturing Co.

East Pittsburgh, Pa.



When A Rush Hits Your Mill WHICH?

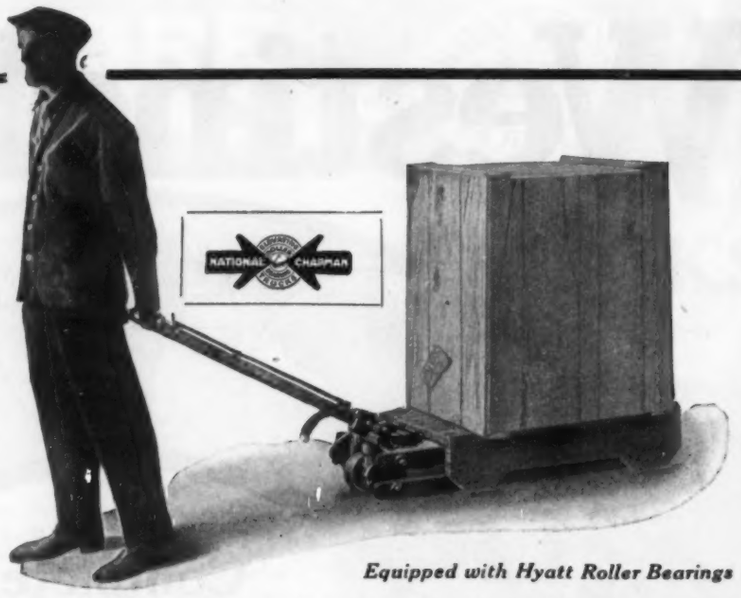
Extra Platforms—$1.50 Each

or

Extra Fixed Platform Trucks $10.00 to $15.00 Each

and a choice

Between Paying for One Man's or Four Men's Labor to do the same amount of work.



Equipped with Hyatt Roller Bearings

IN a nutshell, these are the alternatives which must be faced when occasion arises for the quick enlargement of trucking facilities.

That many mill owners have solved this problem in advance in the money-saving way by installing National-Chapman Elevating Trucks—the "trucking switch engines"—is due to the fact that they prefer to furnish extra platforms, which can be made, at perhaps less than the figure quoted, on the premises. They prefer not to wait for delivery of a lot of fixed platform trucks which cost so much more, do infinitely less work and only serve to increase the trucking pay roll from 50 to 80 per cent. These are the pertinent facts which make the National-Chapman system of trucking well worth investigating.

Send for Illustrated Catalog C. B.

NATIONAL SCALE COMPANY

7 Bank Street Manufacturers of National Counting Machines. **CHICOPEE FALLS, MASS**

FIG 50

LANE

Canvas Mill Boxes and Trucks

FIG 20.

Lane Doffing Trucks are made to wear. Heavy Duck and Spring-steel frame permit rough handling. Light weight, easy running. Mounted on our improved Thread-guard Casters, either stationary or swivel.

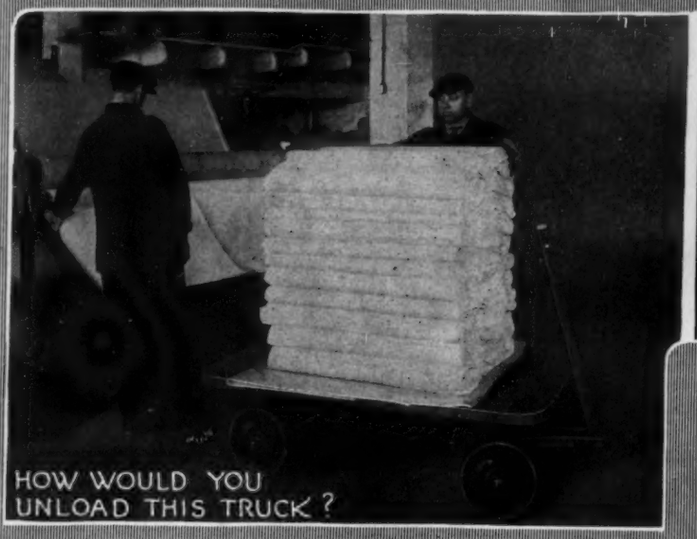
Born and Raised in the "Southland"

Lane Canvas Mill Boxes are free from all roughness, thus reducing waste. Rim bound with tough leather. Shoes of hard maple, renewable.

Sold direct and by leading Supply Houses.

W. T. LANE & BROTHER, Manufacturers, Poughkeepsie, N. Y.

A TRUCKMAN HAS 8 HANDS!



WITH

COWAN

TRANSVEYORS

IN these days of labor scarcity we can't afford to scatter men over the mill doing unnecessary work. Every misspent motion must be made use of. Every ounce of energy of every man must be made productive.

Consider your trucking item. Right here is where you can save a number of men, and put those extra truckers on more productive work.

Suppose you could get one man with one truck to do the same work in less time than four of your present truckers do it. Would you consider it? Of course you would, and that's why you need Cowan Transveyors. They save rehandling of goods, eliminate the useless loading and unloading of trucks, stop piling and repiling of goods before and after trucking.

One man with a Cowan can do the work of four men with old style trucks—because all he does is trucking—no loading and unloading. It enables you to substitute cheap wooden platforms for expensive platform trucks.

The effects of installing the Cowan System is felt throughout the whole mill. Aisles are clean, confusion and delay is eliminated, time is saved, no energy is wasted, business is speeded up, and many dollars are clipped from overhead expenses.

The Cowan Transveyor is the pioneer elevating truck, and therefore meets your requirements more satisfactorily. Some of the largest textile plants in the country, the U. S. Government, and hundreds of the biggest concerns in the country have adopted the Cowan System.

Made in any size for any requirement. Write for catalog today.

THE COWAN TRUCK CO., - Holyoke, Mass.

Makers of Cowan Transveyors.

SOLVING THE SHORTAGE OF LABOR BY AUTOMATIC TRUCKS

Automatic Electric Storage Battery Trucks have proven thoroughly practical in saving labor in interplant transportation in the textile field. In many instances a single truck is doing the work of 5 to 6 men. Complete information and illustrated catalog for the asking. Write today.

The Automatic Transportation Co., 2933 Main Street, Buffalo, N. Y.

The only truck manufacturers to receive gold medal and highest award at the San Francisco Exposition. Pioneer manufacturers of industrial trucks.

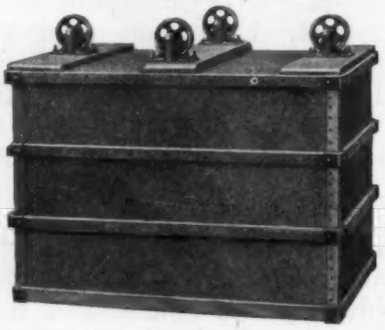
Hercules
TRADE-MARK REGISTERED

Combination Doffing Cars

One stationary and one loose fibre box.
Substantial wood platform.
Self-oiling wheels.
Boxes may be steel clad if desired.

Vulcanized Fibre
Roving Cans, Boxes, Trucks, Barrels, Baskets, etc.
Write for Catalog No. 19.
FIBRE SPECIALTY MFG. CO.
Kennett Square, Pa.

The Buyer Who Knows
Will Always Buy
Keystone Receptacles
Keystone Quality is the Standard
FOR ALL MILL BUYERS



Warehouse Car Showing Bottom Construction.

Noted for their Construction, Quality and Durability.

The superiority of **KEYSTONE Products** is the result of our years of experience in the manufacture of fibre products.

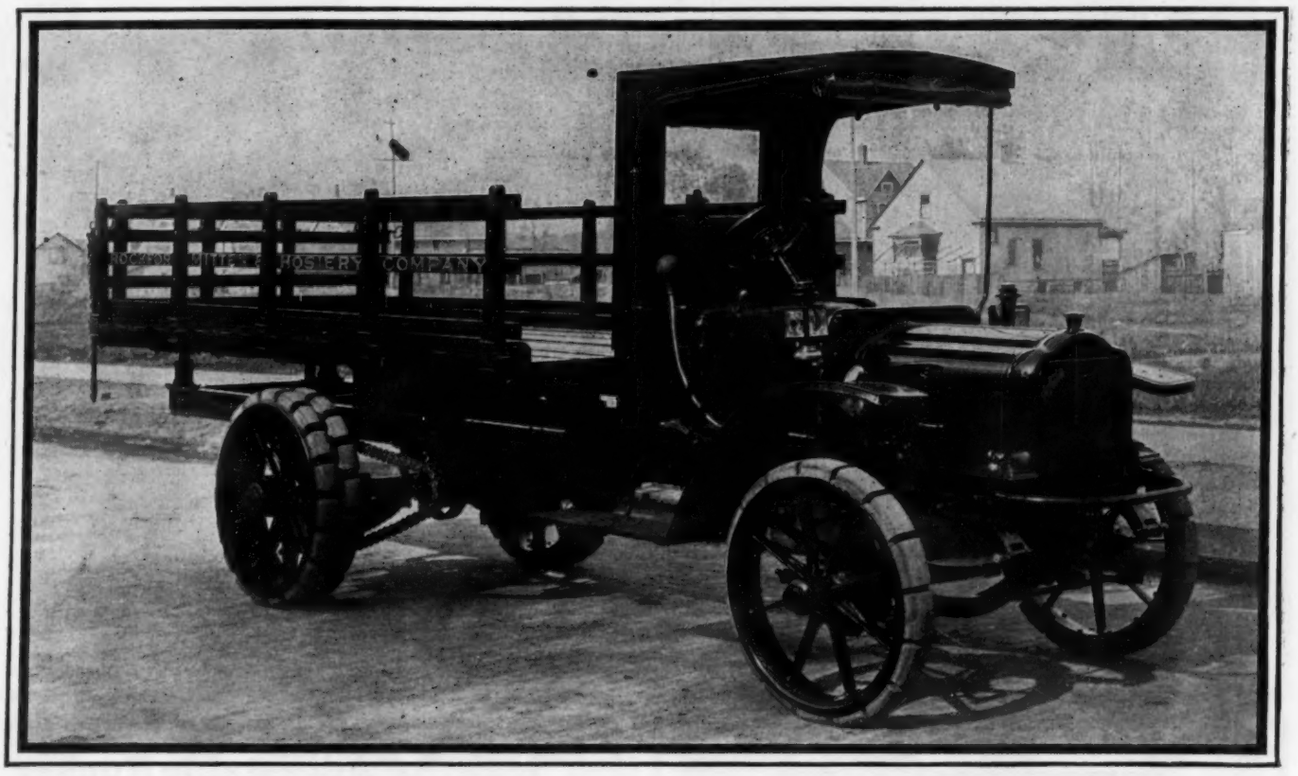
Make no purchases of mill receptacles until you have informed yourself on the quality and prices of **KEYSTONE Products**.

Send your address on a postcard, *now*, and we will forward Catalogue "D."

KEYSTONE FIBRE COMPANY, Yorklyn, Del.

Southern Agent, H. C. Smith, Greenville, S. C.

WHITE TRUCKS



AN OWNER'S OPINION

"We could write a book on White Trucks, but to be brief will say that the first truck, purchased in May, 1911, with two bodies—one platform and one coal—has been in continuous operation all this time. It has been without repairs, other than to the tires, and has not been off the streets any one working day since we bought it.

"We have since bought two more White Trucks and they are giving equally good service.

"We are so well satisfied with the trucks we have, the Whites, that nothing could induce us to even make a test with any other."

ROCKFORD MITTEN & HOSIERY COMPANY

THE WHITE COMPANY

CLEVELAND

Largest Manufacturers of Commercial Motor Vehicles in America

CHAPMAN BALL BEARINGS

Saving Profits

"During the next ten years some of the largest profits in American Industry will be saved out of operation. Heretofore profits have been made, but saving a profit is altogether different."

CHAPMAN BALL BEARINGS

the bearings with the double row of balls—begin the saving at the very source of loss. They can save every ounce of that power that is wasted now in overcoming the frictional resistance of those plain bearings on your lineshafts. That waste, eating into your profits, amounts to more than you may think. Some of your profits from these days of prosperity, invested in Chapman Ball Bearings, will help you pay dividends in days of keener competition.

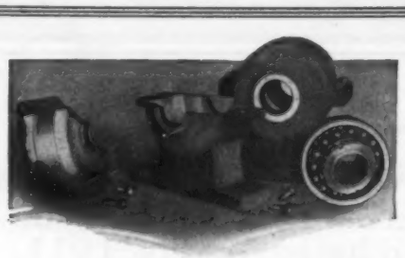
Investigate—Send for our book on Bearings.

TRANSMISSION BALL BEARING COMPANY, Inc.

1050 Military Road, BUFFALO, N. Y.

New York: Room 101, 30 Church St. *Branch Offices* Philadelphia: Bourse Building

CHAPMAN DOUBLE BALL BEARING CO., Ltd., 339-351 Sorauren Ave., TORONTO, ONT.



Card Cylinder Box.

Absolute Cleanliness

When Cards are Equipped with

HUBBARD BALL BEARING BOXES

Cards built with *plain* bearings sometimes acquire an accumulation of oil-soaked lint or fly, which drains the box of its oil. This leakage often times gets on the card clothing and causes rapid destruction.

Such annoyances are entirely avoided by the use of Hubbard Ball Bearing Boxes, which are always clean and free from oil saturated fly. They need very little attention because they use a light grade of grease which only needs renewing once in several months. The savings in power by the use of these boxes is undisputed, and they always pay for themselves in power saved.

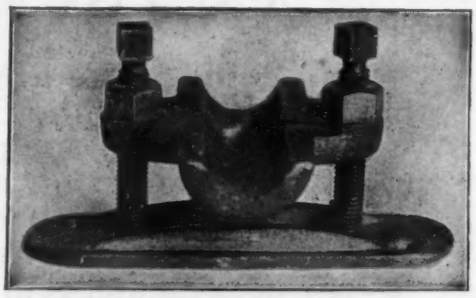
The permanency of Hubbard Boxes and their many advantages assure the long continued, increased quantity and uniform quality production of carded stock without soiled goods or machine tie-ups.

Write today for interesting bulletin.

Hubbard Machine Co., *Worcester, Mass.*

L. L. Nakashian, Greensboro, N. C.
Mr. Sidney H. Scott, Greenville, S. C.

DAY Adjustable Rocker Shaft Bearings



No. 1 A. Patented Oct. 26, 1915.

THIS is just a common sense attachment that has not failed to satisfy a single mill.

Your rocker-shaft troubles will be over when you equip your looms with Day Adjustable Bearings. They will save you the cost of a new rocker shaft for all time, reduce seconds and thin places, save in supplies, break-outs, and in many other ways.

As one Georgia mill superintendent wrote us,

"Any practical mill man who will test these bearings, will find at least twenty different ways in which they will keep the loom in better shape and increase production. I would advise any mill man to try these bearings and be convinced of the merit of it, like I have been."

This man equipped his 1820 looms with Day Adjustable Bearings.

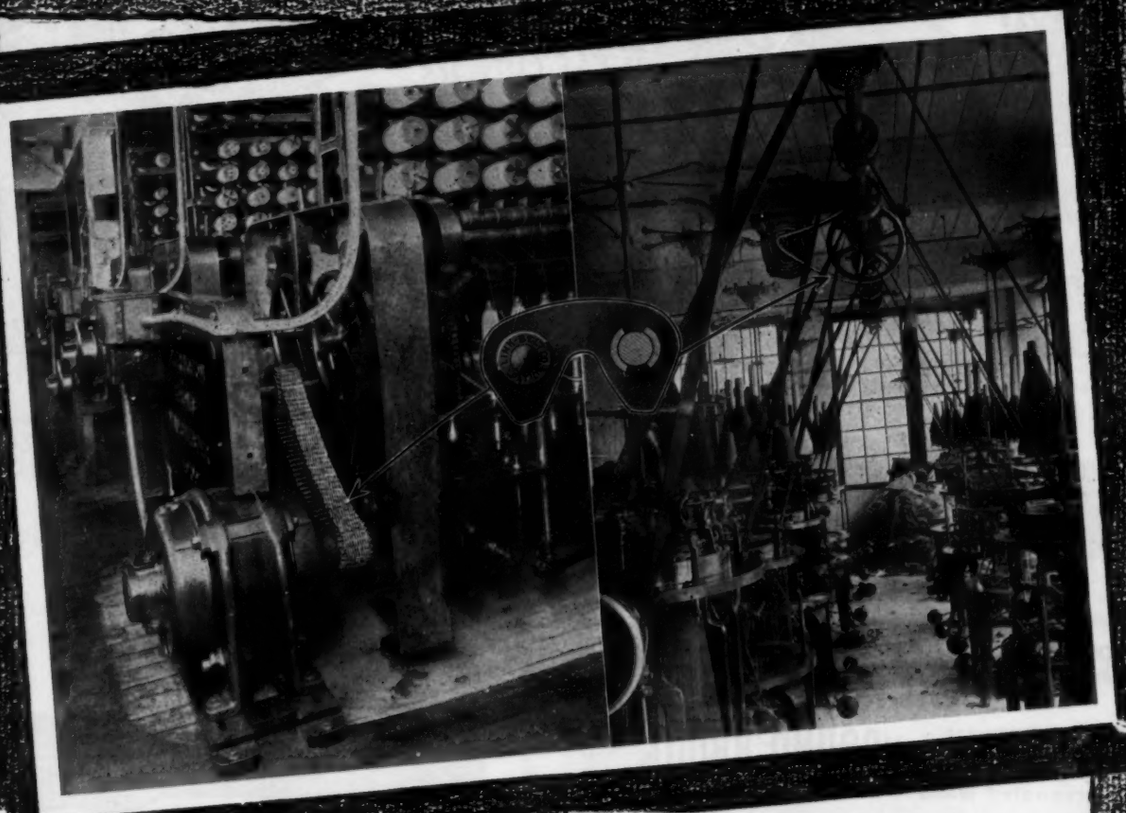
Any of the many mills using them will tell you about their many advantages.

Let us send you a pair for trial. State kind of loom. Write today.

Textile Specialty Company

(Formerly Day Adjustable Bearing Company)

GREENWOOD, S. C.



LINK-BELT
SILENT CHAIN

Increases production in textile mills

because it is a positive transmission. All the power of the motor is delivered to the lineshaft or individually driven machine, at the correct speed, without slip—at an efficiency of over 98%. Have you studied the effect of slip in power transmission on **your** output and product? It is well known that losses of from 10% to 20% are due to slip. Link-Belt Silent Chain Drives are positive at any load, and under any atmospheric conditions. They guarantee the efficient use of power, and eliminate the journal friction caused by tight belts. Are you using them in your factory?

Write for Data Book No. 125—a handbook of Silent Chain practice. Or, send for a Link-Belt engineer to confer with you, and lay out power saving Silent Chain Drives for your plant.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

New York . . . 299 Broadway
Boston . . . . 49 Federal St.
Pittsburgh . . . 1501 Park Bldg.
St. Louis . Central Nat'l Bank Bldg.
Buffalo . . . 698 Ellicott Square
Wilkes-Barre . 2d Nat'l Bank Bldg.
Cleveland . . 429 Rockefeller Bldg.

Detroit . . . 732 Dime Bank Bldg.
Minneapolis . . . 418 S. Third St.
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(Impregnated Wood) **(Graphite-and-Bronze)**

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You'll never have to stop your machine, due to the neglect of someone to properly oil it, providing you use NIGRUM or BOUND BROOK Oilless Bearings.

They run smoothly and evenly without oil, grease or attention. They will save you money by saving you oil, and eliminate much of the wear and tear upon the working parts of the machine.

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All Genuine Graphited "Oil-less Bearings" have always been made at Bound Brook, N. J., in the United States of America.

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SYSTEM OF ROPE DRIVING

This coupling is for use on the English system rope drive and controls all stretch of the individual ropes in this system.

Hunt Coupling ready for use.

You can shorten the ropes at any time by simply twisting the coupling, which twists up the strands of the rope and maintains the original rope diameter.

The shortening is done with the rope in position on the pulleys and all splicing costs and delays are avoided.

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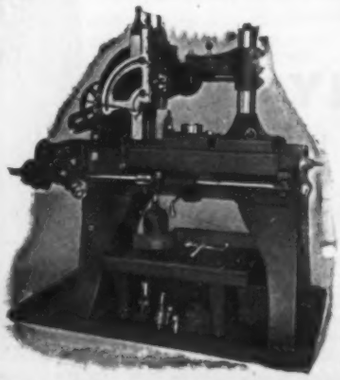

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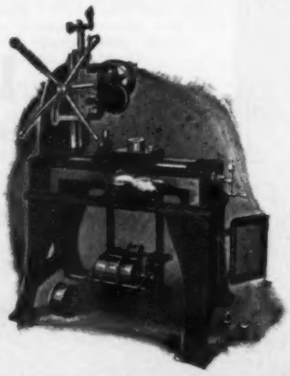

An Increase From 6 days to 5½ Years

Smoother than Grease

Oilless Bearings

that is but a typical any day record for Arguto Oilless Bearings—but just to get the story out in the way it came to us, note these two letters:

* * *

We also wish to advise that we received the twelve bearings covered by our order No. 914, and beg to advise that your bearings are giving the best of satisfaction, in fact we are using them on Erie clutch pulleys where brass would not stay over six days.

Yours truly,
Pioneer Pole and Shaft Company.

Dear Sirs:—We send you herewith an Arguto bearing which we ran continuously for about five and one-half years as the bushing of a clutch pulley. This bearing has lasted in a remarkable manner, being apparently as good as when first received.

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Arguto Oilless Bearings *do* outwear the best bronze; they *do* reduce overhead charges; they *do* eliminate both life and fire hazards in the lubrication of transmission machinery; they actually *do* increase production efficiency. Ask us how, there's no obligation.

Arguto Oilless Bearing Co.

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PRODUCTION

PRODUCTION logically falls into two general classes—quantity production and quality production. Quality machinery is essential to both.

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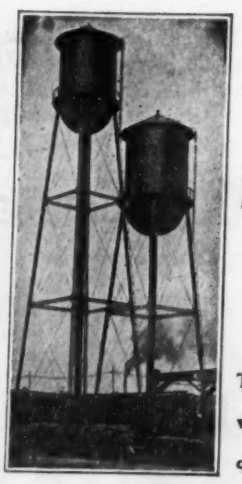

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Tell us what you want and let us quote prices.

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What The Morehead Back to Boiler SYSTEM Does for the Textile Mill Operator

¶ *Automatically keeps every ounce of condensation drained from your steam lines.*

¶ *Speeds up your production by keeping every inch of heating surface in your slashers, calenders, dye vats and other steam heated equipment constantly ACTIVE—working at top capacity.*

¶ *Saves coal for you by returning all condensation directly to the boilers as pure hot feed water—in just the condition to use again with the least consumption of fuel.*

¶ *Immediately stops the large but invisible losses you are now suffering because of sluggish circulation in your steam lines.*

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Now when labor and fuel costs are rising so rapidly is the time to find out how quickly and inexpensively the Morehead System will remove the condensation difficulties you are having in your own mill—how it will help you hold down your overhead and maintain your legitimate profits.

Our engineers are here to co-operate with you—and assist you in every way. Just write a brief description of the conditions you are up against—and we will advise you fully by return mail.

Morehead Mfg. Company

Detroit, Michigan

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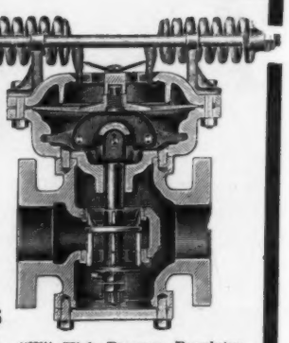

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Foster Valves are part of the basic resources of industrial America. They are quick and mighty to meet any crisis. They have balanced strength and micrometer perfection of detail which holds well with required present-day efficiency.

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We make High Pressure Regulators, Low Pressure Regulators, Back Pressure Valves, Float Valves, Free Exhaust Valves, Pump Governors, etc.

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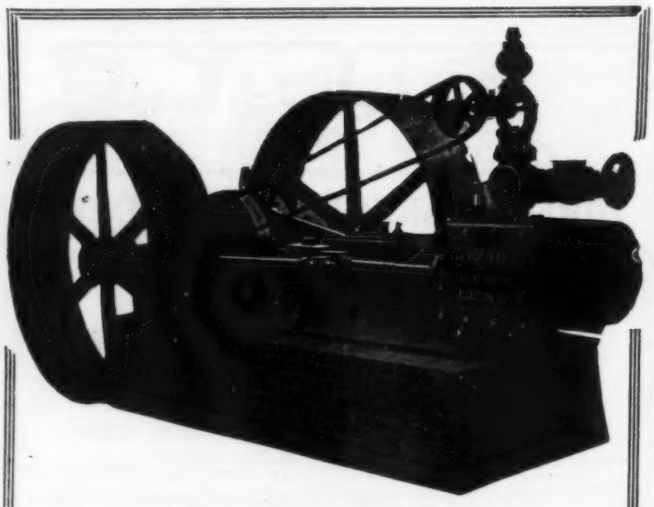

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For Engine and Transmission Bearings

When the importance of bearing lubrication is considered—the fact that the very life of the machinery depends on it—the cost of the necessary lubricating device becomes insignificant. The selection, therefore, of Oil and Grease Cups should be governed by their reliability in service and their durability. These features are embodied in Lunkenheimer Oil and Grease Cups. The practical designs, the high grade materials used, the expert workmanship and the years of satisfactory service which they give proves this. The extensive line includes Oil Cups with glass or bronze body, with or without sight-feed and Grease Cups with automatic or screw feed, in bronze, iron or steel. From among the many types made can be found a cup suitable for every service requirement.

Buy the Best—They are the Cheapest

Your local dealer can furnish them; if not, write us. Write for Booklets Nos. 523 and 524

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Largest Manufacturers of High Grade Engineering Specialties in the World
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It is not a question whether or not you will advertise.

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Are you keeping in step with the modern spirit of business?

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Our business has increased 800% in the last two years.

It shows that the mills appreciate our efforts.

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Oxy-Acetylene Welding and Cutting

Sixteen damaged teeth on this gear wheel were built up by welding, at a cost of only $40.00

$500 Gear Wheel Saved by $40 Welding Repair

This big gear wheel, seven feet in diameter and weighing 3,000 lbs. was repaired "on the spot" by the Prest-O-Lite Process. Sixteen damaged teeth built up by welding, making the wheel good as new.

Total repair cost was $40.00. Cost of a new wheel would have been $500. Oxy-acetylene welding, therefore, made a clean-cut saving of $460.

This same concern is saving an average of $1,000 per month by using oxy-acetylene welding for repair work.

Similar savings are possible for practically every textile mill. Don't let break-downs tie up *your* production. Let this process save you time and money by preventing costly delays and expensive replacements of operating equipment.

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Employs both gases (acetylene and oxygen) in portable cylinders. Prest-O-Lite Dissolved Acetylene (ready-made carbide gas), is backed by Prest-O-Lite Service, which insures prompt exchange of full cylinders for empty ones. Provides dry, purified gas, insuring better welds, quicker work and lower cost, and also avoids the large initial outlay and heavy depreciation incurred in making crude acetylene in a carbide generator.

Necessary equipment is not expensive. We furnish high-grade welding apparatus for $75 (Canada $100); acetylene service at additional cost. Adaptable for oxy-acetylene cutting by the addition of special cutting blowpipe. Thorough instructions are furnished free to every user of Prest-O-Lite Dissolved Acetylene—any average workman who understands metals can learn the process quickly and easily.

Full information and illustrated literature showing hundreds of profitable uses for this process gladly sent on request. Write today.

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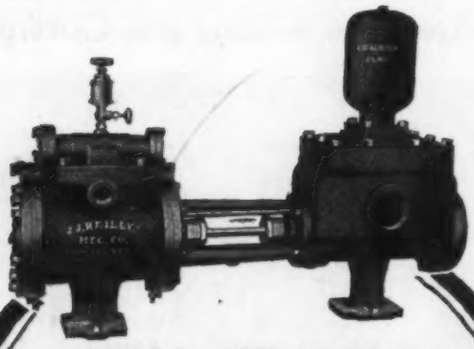
59 Branches and Charging Plants.

World's Largest Makers of Dissolved Acetylene



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There are two kinds of pumps—good pumps and inferior pumps.

Grainger Pumps are the best that engineering skill can produce. They are all constructed to give the longest and most satisfactory service possible. They are carefully tested to their full rated capacity and are packed and shipped all ready for operation.

Boiler Feed Pumps, General Service Pumps, Tank Pumps, Light Service Pumps, Vacuum Pumps—whatever your requirements are, we can supply you.

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WHAT IS A LIFE WORTH

INSTALL THE ABOVE FIRST AID CABINET and be equipped for the **inevitable accident.** Price $9.50. Sent on 60 days approval. It is white enameled steel, contains 150 yds. of bandages, dressings, antiseptics, and everything else needed in an emergency.

Let us send on approval.

The Accident Cabinet Co., Kalamazoo, Mich.

The Fountain Is Cork Jacketed 15 1-2 Coils of 1-2 in. Brass Pipe and Keith Bubbler; Capacity Continuous Line of Users.

A GOOD DRINK ICE COOLED

Drink right from the fountain without cups or contamination. The water is cooled as it flows from the municipal supply pipe through the cork-jacketed ice tank to the Keith Bubbler.

One supply of ice lasts through the hottest day and cools all the water ever required.

Everybody like the bubbler because it's sanitary.

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Send for our complete catalog, showing our Wash Bowls, Metal Lockers, All Steel Stools and Chairs with Inset Wood Seats, Stock Storage Racks, Metal Shelving, Metal Vault Fixtures, Improved Soda Kettles, 40 and 60 gallons, Water Heaters and Instantaneous Mixers, Bubbling Drinking Fountains, Work-Benches and Bench Legs, Drawing Stands, etc.

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Even if it were covered completely by insurance, think of the lost profits on unfilled orders, the lost files of data, account books, etc., and you will resolve to protect your plant against fire.

But don't wait until you're burned out before protecting your plant? An ounce of prevention is worth a pound of cure. If a fire was to start in your mill, are you prepared to quench it before it gains headway? If not, then the cheapest and most efficient protection is with the aid of

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They pay for themselves by reducing the cost of fire insurance, as insurance companies recognize their value and will reduce your rates if you install them. Ask your insurance agent.

They are big enough to extinguish a good sized fire, yet small enough to be quickly and easily handled.

They are examined, tested and labeled under the direction of the Underwriters' Laboratories, Inc.

Ask us today to send you prices of an installation of Acmes in your mill.

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BETZ FIRST AID AND ACCIDENT CABINET $7.75

Recognized as the most complete and practical outfit of its kind. Endorsed by Industrial Surgeons and Welfare Bureaus in every section of the country.

This cabinet is a small and compact arrangement, containing all necessary First Aid supplies and may be easily carried about the factory or hung on the wall. The cabinet is made of heavy sheet steel, finely enameled. It is built to hold standard containers of various supplies, including individual racks for bottles in the lower shelf. This is a feature found only in the Betz First Aid cabinet and its value is evident as it prevents the bottles from tipping, breaking or spilling.

Complete and Comprehensive Directions

For First Aid are furnished with each cabinet, being pasted on the inside of the door and in addition an authoritative First Aid Manual is included. With the aid of these directions it is easy to train and teach workmen how to apply intelligent First Aid pending the arrival of the Doctor. The directions are so clear and plain that the ordinary lay person can easily grasp the instructions.

The Betz First Aid and Accident Cabinet includes the following Supplies:

9-1 inch Gauge Bandages,
9-2 " " "
3-3 " " "
4-2 oz. Pkg. Absorbent Cotton.
24 Picric Acid Gauze Pads, (for burns)
6 Pkgs. Plain Gauze,
1 Roll Z. O. Adhesive Plaster,
1 Tourniquet,
1 pr. Dressing Scissors,
1 pr Thumb Forceps,
12 Wooden Tongue Depressors,
6 Cotton Applicators in glass tube,
1 Eye Dropper,
Safety Pins, assorted sizes,
12-12 inch Applicators,
1 Medicine Glass, graduated,
1 Eye-Cup or Douche,
1-2 oz. bottle Boric Acid,
1-2 oz. bottle Alcoholic Iodine,
1-2 oz. bottle Aromatic Spirits Ammonia.
1-2 oz. bottle Jamaica Ginger.
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2-3 oz. tubes Burn Ointment.

2X4600. Betz First Aid and Accident Cabinet, complete with supplies as listed above only $7.75

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The accessibility of clear, cold drinking water and the way it is supplied to the workmen is a matter of extreme importance to every manufacturer. Consequently, hundreds of plants are today equipped with the most modern and economical solution to the problem. If doing this had not proved profitable, these concerns would again be using old cup and hydrant methods. But they are not. Many are placing further orders. They have learned the practical results produced by

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RUNDLE-SPENCE MFG. COMPANY
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Men Comfortably Housed

are more productive, happier and contented.

Ready-Bilt Steel Portable Cottages

will solve your housing problem.

They are quickly and easily erected,—they are strong, fire proof, durable and comfortable. All parts sectional and interchangeable. Easily moved.

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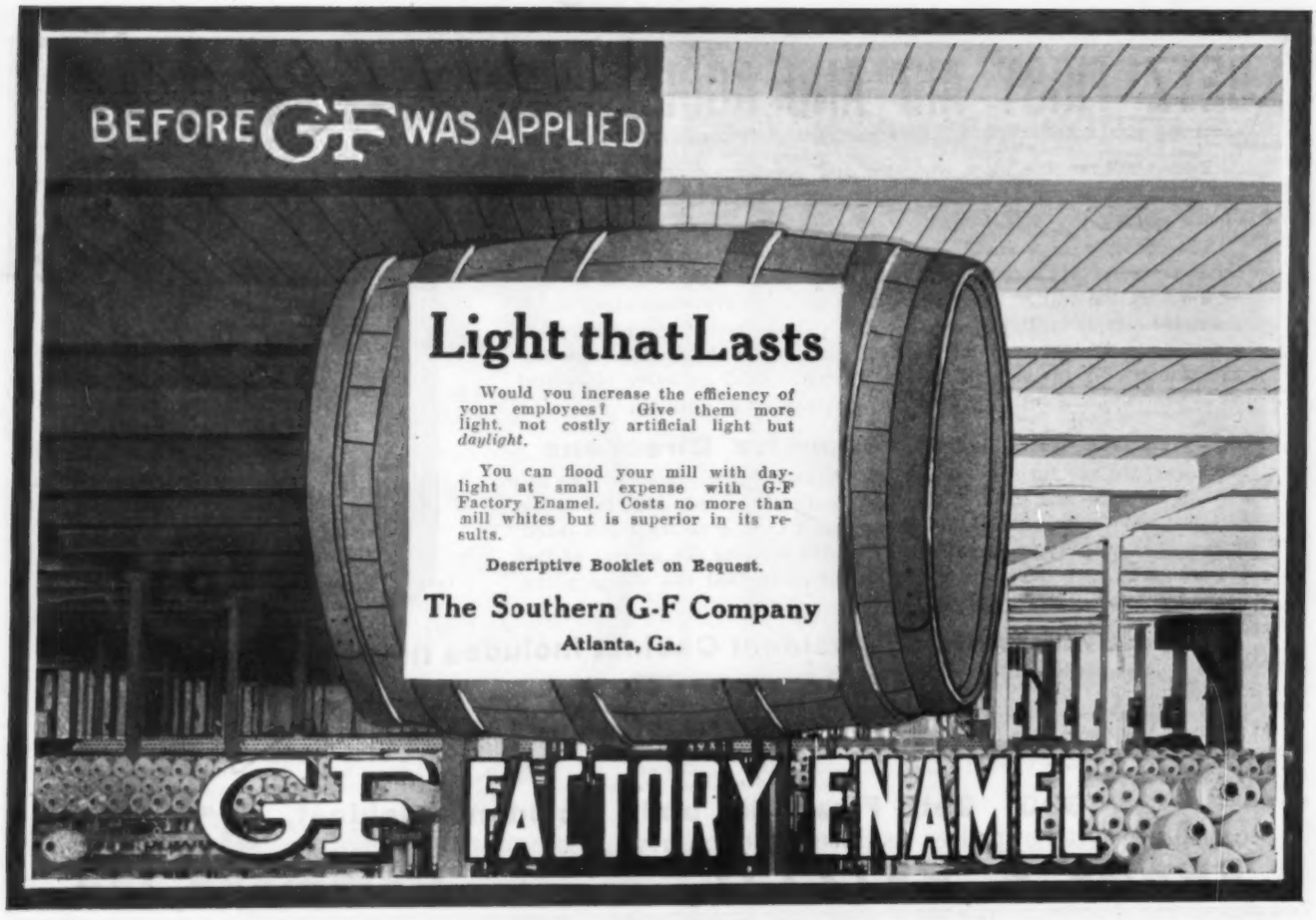
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Would you increase the efficiency of your employees? Give them more light, not costly artificial light but *daylight*.
You can flood your mill with daylight at small expense with G-F Factory Enamel. Costs no more than mill whites but is superior in its results.
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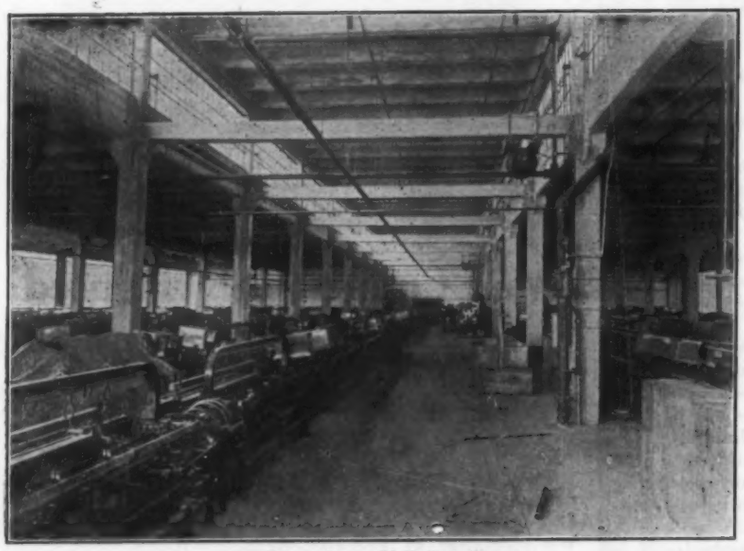

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is installed for Fire and Breakage Protection, Light Diffusion and Minimizing Cost of Maintenance.

Let us mail you samples and literature which will give valuable information.

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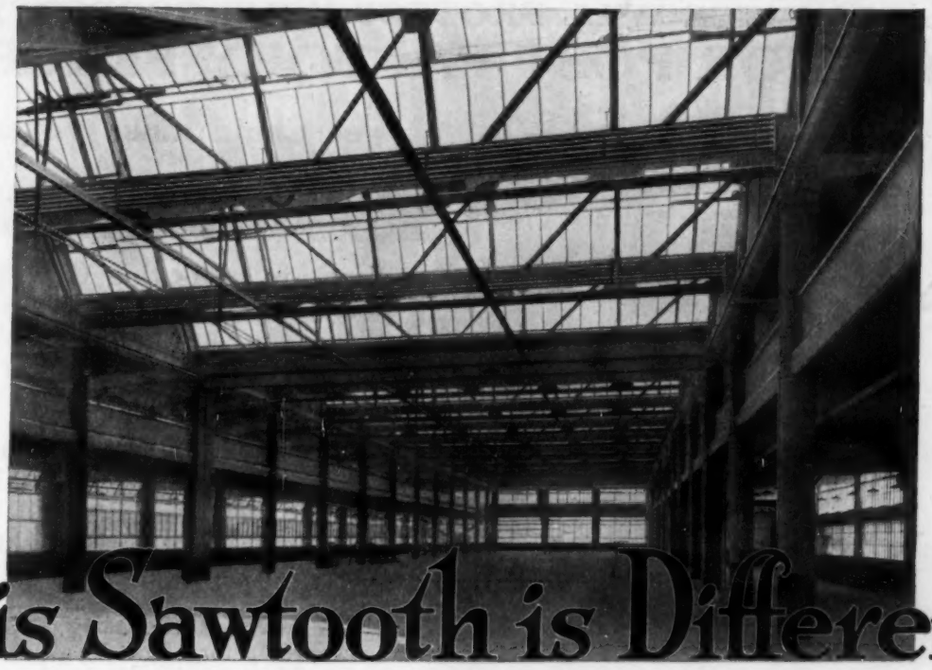

This Sawtooth is Different-

You have seen sawtooth roofs, but never—unless you have been on this Goodrich top floor—have you seen the last word in sawtooth ventilation as well as lighting!

A thousand men and girls, working at top speed "assembling" soles and welts and uppers into rubber footwear ready for the vulcanizers, require unfailing fresh air regardless of weather. How do they get it?

First, the sawtooth continuous sash is top-hung and unbroken, therefore rainproof when open. Stale air can escape, rain or shine.

Second, similar continuous sash over the windows admits fresh air constantly.

Third, both inlets and outlets are uniform the entire length of the floor.

Fourth, a single electric motor in each wing controls simultaneously all the sawtooth lines in that wing. One operation opens and closes all the inlet sash on either side.

Results: (a) Fresh air reaches every part of the floor; stale air goes straight up and out; no pockets or back currents; (b) Ventilation is controlled by foreman; it is not dependent on the worker's caprice; (c) Abundant lighting over entire area of 1 1-6 acres.

This principle of weatherproof, equally balanced inlets and outlets, with all outlet lines simultaneously controlled, can be applied to great advantage wherever numerous workers are employed on intensive production and the building width is not too great to permit the central bays to be reached by fresh air.

LUPTON PRODUCTS

- Lupton Steel Sash
  - Pivoted Factory Type
  - Counterbalanced Type for factories.
  - Counterweighted Type for offices.
  - Power House Type
- Pond Continuous Sash for Pond Truss, sawtooths, monitors and side walls
- Pond Operating Device for long lines of sash
- Lupton Rolled Steel Skylight
- Lupton Steel Partition and Doors
- Lupton Steel Shelving

This and many other notable factories where our co-operation with the architect or engineer has produced unusual results, are described in a booklet, "Air, Light and Efficiency." It's free.

Let us help solve your lighting and ventilating problems.

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Amber St. & Allegheny Avenue
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Bldg. No. 40, B. F. Goodrich Co., Akron, Ohio. A. P. Lohman, Mgr. Engineering Department. Osborn Engineering Co., Cons. Engineers.

14 sawtooth lines 70 ft. long over one wing; 3 sawtooth lines 140 ft. long over the other, all with Top-hung Pond Continuous Sash. Underlapping storm panels at ends. Lupton Steel Sash, Counterbalanced Type, in windows throughout; equal top and bottom openings ensure ventilation on floors 1 to 4.

STEEL SASH — PARTITIONS — DOORS

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"INVESTMENT VALUE"

THIS FENCE WILL PROTECT YOUR PROPERTY

ANCHOR POST FACTORY FENCES

of Chain Link Woven Steel

form an unclimbable and practically indestructible factory enclosure.

They are protecting Government property and Industrial Plants in every part of the country and are the accepted standard by which all other fences are judged.

Anchor Post Fences not only provide perfect protection, but are also an economy as their long life and low upkeep more than offset their slight additional cost.

CATALOG. Our Catalog is a text book on modern factory fences, and contains much valuable data upon the subject. We will be glad to send a copy promptly .

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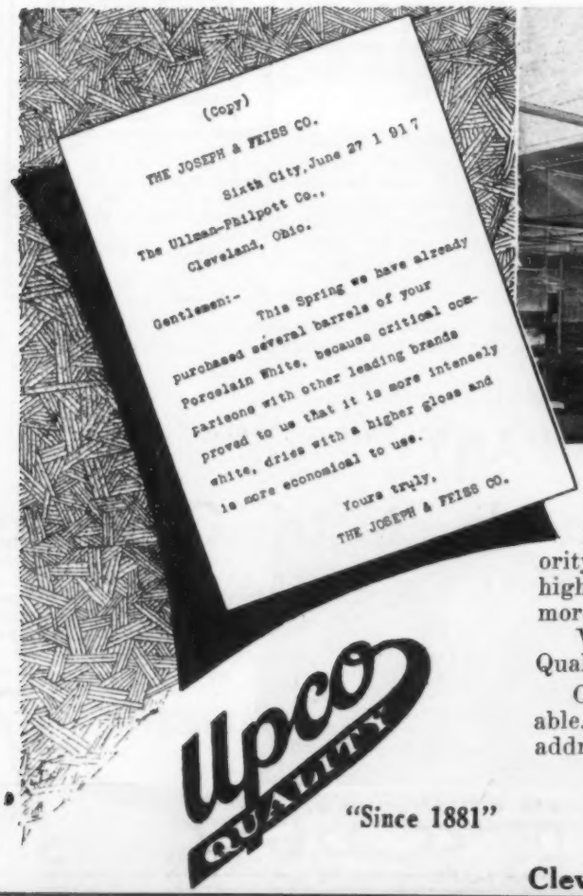
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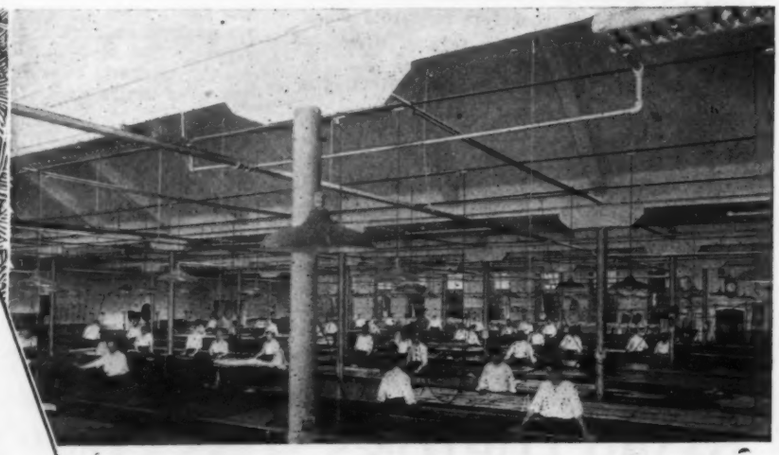
Cleveland, Ohio.
Gentlemen:-
This Spring we have already purchased several barrels of your Porcelain White, because critical comparisons with other leading brands proved to us that it is more intensely white, dries with a higher gloss and is more economical to use.
Yours truly,
THE JOSEPH & FEISS CO.



Upco QUALITY

"Since 1881"

Some Evidence of Upco Superiority

Every comparative test has proved beyond a doubt, the superiority of Upco Quality Mill White—has proved that it retains its high snowy gloss longer, no matter how often washed—that it is more economical to use.

Why not light up your dark walls and ceilings with Upco Quality?

Our booklet, "Light Without Power" is interesting and valuable. Where shall we send your copy? Just put your name and address on a post card and address it to

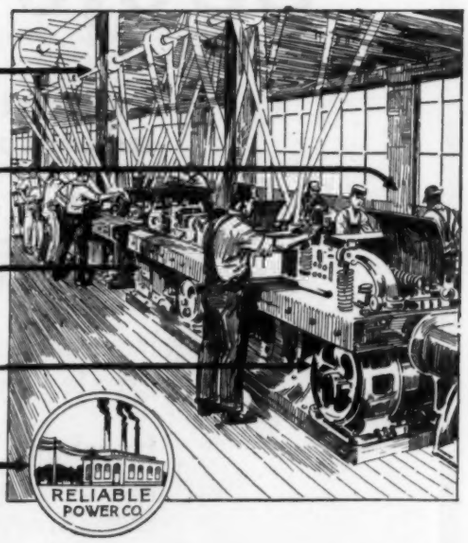
The Ullman-Philpott Co.

Industrial Paint and Varnish Laboratories

Cleveland, : : : : Ohio

LINCOLN MOTORS

Motor Drive Advantages



CUT OUT BELTS AND SHAFTING

Power is not wasted in friction or slippage. Upkeep is saved, walls and ceilings are free, rooms are lighter and cleaner.

LOCATE MACHINES ANYWHERE

Machines are easily moved or installed and can be put in the best location. No belts or shafting to plan for.

IDLE MACHINES TAKE NO POWER

When a few operators or machines are idle no line shafts are running, no power is being wasted on these machines.

LESS DANGER OF FIRE

Insurance rates are lower on the motor-driven plant. No sparks or fire to ignite inflammable material.

NO SHUT DOWNS

With central station service your plant will seldom, if ever, be tied up for lack of power.

When you point out the advantages of motor drive to prospective customers, why not call their special attention to the particular advantages offered by the Lincoln Motor.

WATER PROOF—DUST PROOF INSULATION

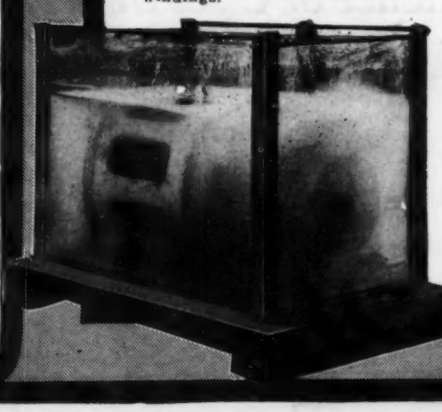
Lincoln Motors are operating under the worst of moisture and dust conditions.

OVERLOAD CAPACITY

There are many installations where Lincoln Motors are working at 100% over their rated capacity with no trouble whatever.

SIMPLE CONSTRUCTION

Any workman who can operate a piece of machinery can give the Lincoln Motor all the care it requires.



This standard Lincoln Motor has operated under water for over 3 years without damage to windings.

"Link Up with Lincoln"

Ask for Motor Book 101-N

The Lincoln Electric Company

Cleveland. O. **Charlotte, N. C.**

New York City (Singer Bldg.)
Buffalo
Syracuse
Chicago
Columbus
Detroit
Boston
Philadelphia
Pittsburgh
Toronto, Canada

Agencies in other principal cities

60,000 ELECTRIC MOTORS
TOTALING
850,000 HORSE POWER——

Represent the Recognition by the Textile Industry of the Advantages of Electric Power

These are days of **easy money** in the Textile world, but keener competition and more difficult market conditions are predicted for the quite near future.

Purchased Electric Power Service means a **greater production** of a **superior product.**

Purchased Electric Power Service facilitates either **efficient expansion** or **successful retrenchment.**

These are the factors that will determine your place in the Textile world when market and competitive conditions are difficult.

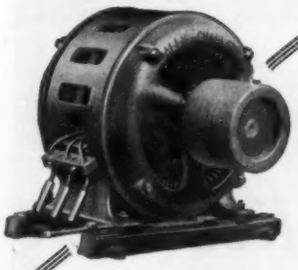
Without obligation on your part, our Sales Department will gladly furnish equipment specifications and estimates of cost.

Central Georgia Power Co.

Macon, Ga.

Service available in the following cities:

Macon	**Thomaston**	**Jonesboro**
Forsyth	**Griffin**	**Jackson**
Barnesville	**Hampton**	**Monticello**



MOTORS

FOR

EVERY SERVICE REQUIREMENT

In practically every industry where power is used Allis-Chalmers Motors are today in successful operation.

These motors have been applied to almost every well known make of machine.

Our experience as a pioneer in the application of motors for individual drive and that gained during a quarter of a century devoted to the design, building and commercial application of motors of all kinds will be of inestimable assistance in the selection of motors adapted to your particular service requirements.

Allis-Chalmers Mfg. Co.

Milwaukee, Wis.

Sales Offices in All Principal Cities

The Heart of an

ECONOMY

renewable cartridge

FUSE

is the "Drop Out" Renewal Link. It is the only thing you have to replace in order to renew a blown ECONOMY FUSE. The expense is trifling, compared to the utter extravagance of discarding an entire fuse after it has operated.

Use Economy Fuses in your plant and by their use cut yearly fuse maintenance bills a full 80 per cent.

Write for free Samples. Test them. Let the results speak for the economy and safety of Economy Fuses. Be sure to ask for Catalog 39.

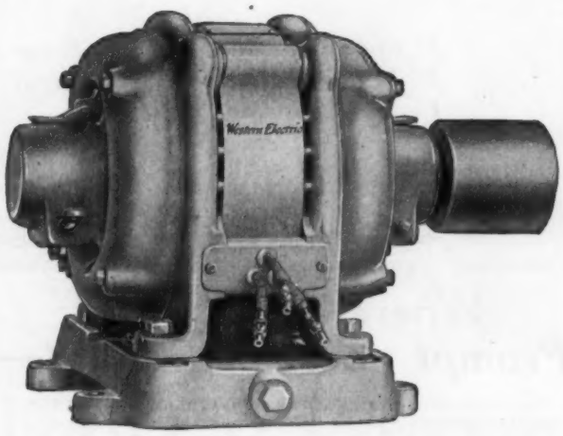
Economy Fuse & Mfg. Co.

Kinzie and Orleans Sts., CHICAGO.

At Leading Jobbers.

Information on Power Apparatus

We have just issued new concise bulletin leaflets on motors for direct or alternating current. The motors are suitable for all power requirements and especially of interest in Textile Mills.



A Type of Western Electric Single, Two or Three Phase Induction Motor, ¼ to 5 H. P.

Write our nearest house below for literature on the class of motor service you are interested in.

Western Electric Company

INCORPORATED

New York	Atlanta	Chicago	Kansas City	San Francisco
Buffalo	Richmond	Milwaukee	St. Louis	Oakland
Newark	Savannah	Indianapolis	Dallas	Los Angeles
Philadelphia	New Orleans	Detroit	Houston	Seattle
Boston	Birmingham	Cleveland	Oklahoma City	Portland

Pittsburgh Cincinnati Minneapolis St. Paul Omaha Denver Salt Lake City

EQUIPMENT FOR EVERY ELECTRICAL NEED

Member Society for Electrical Development. "Do it Electrically"

Send Us Your Orders for Electrical Supplies—

Test us out on quick delivery. Ask for anything you need in supplies and apparatus electrical and see with what despatch we fill your orders.

Southern mills will find that our warerooms, stocked at all times with every needful, will prove their haven in times of distress.

If you do not have a copy of our 800 page illustrated catalog, then ask for one. It is free.

CARTER ELEC. CO.
72 N. BROAD ST.
Atlanta, Ga.

Where Quality and Prompt Service Count—

Your electrical equipment is of paramount importance in the efficient and continuous operation of your mill. Reducing the quality to get a cheaper installation is like cutting down the size of timbers or walls to build a cheaper building.

You can't afford to experiment with your electrical equipments. It's best to consult experts—call on us.

Walker Electric & Plumbing Company
Plumbing, Heating and Electrical Contractors,
ATLANTA, ROME and COLUMBUS, GA.

over the entire mill. All electrical wiring etc. to be done by J. M. CLAYTON. Atlanta, Ga.

Put This in Your Specifications

and be assured that the wiring of your mill is done right and all lights and electrical equipment installed correctly by experts who specialize in textile mill electrical work—a concern who has wired and installed equipment in such mills as Fulton Bag & Cotton Mills, Bibb Mfg. Co., Texas Cotton Mills, Thomaston Cotton Mills, and scores of other big textile plants.

We will be glad to furnish estimates on any electrical work in the mill or mill village, large or small. May we serve you?

J. M. CLAYTON, *Electrical Contractor* ***Atlanta, Ga.***

T. H. McKINNEY
INC.

CONTRACTING ELECTRICAL ENGINEERS
ATLANTA, GA.

The quality of your Electrical Installation should be considered as equal in importance to the efficiency and design of your machinery.

We specialize in Textile Mill and Village Lighting. We are glad to furnish estimates on request.

Best Grade Renewed Lamps

Both Carbon and Tungsten Types

We guarantee you most for the money

BOSTON ECONOMY LAMP DIVISION
National Lamp Works of General Electric Company
Maple St. DANVERS, MASS.

Speed up with Electric Power

75% of all electric power used in the textile mills of this country passes through G-E Motors

HERE are some of the ways in which modern industry has been speeded up by putting electric power to work in the right place.

Metal mines have boosted output to meet world-wide demands. Great central power plants in place of small local plants in coal mining areas now supply cheaper electric power per ton output for each mine. All tonnage records have been smashed in the steel industry. Greater automobile output has lowered prices and given better road transportation. More and better cloth has been produced at lower power costs.

The engineering problems solved in putting electric power to work in these and other industries were many and intricate. Production of electrical equipment suited to this work and in quantities required is an important part of this company's service to American industries.

Any problem involving the use of power can be simplified by the application of electricity. The General Electric Company is well equipped to lend valuable assistance in working out such problems and is glad to co-operate with manufacturers and engineers in every possible way.

G-E Motor Drive

GENERAL ELECTRIC COMPANY

General Office, Schenectady N.Y. Mill Power Dept. Boston, Mass.

7174

FELCO

Quality Brushes

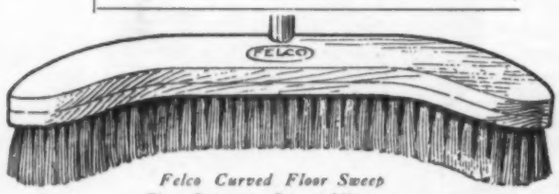
MILLS that recognize quality in brushes—brushes that are made from the best materials and by the most expert workmen—brushes that are made to stand the use and abuse of long and severe service—are demanding Felton Mill Brushes.

There's a Felton Brush for every use in the mill at the lowest price consistent with the high standard of quality.

We have a special department for brush repair work, and your broken or worn out brushes will be repaired carefully and promptly.

S. A. FELTON & SON CO.
Manchester, N. H.

D. D. FELTON BRUSH CO.
Atlanta, Ga.



Felco Curved Floor Sweep For Spinning Room Alleys.

DUCK SHUTTLES

PROMPT DELIVERY

SHAMBOW SHUTTLE COMPANY

WOONSOCKET, R. I.

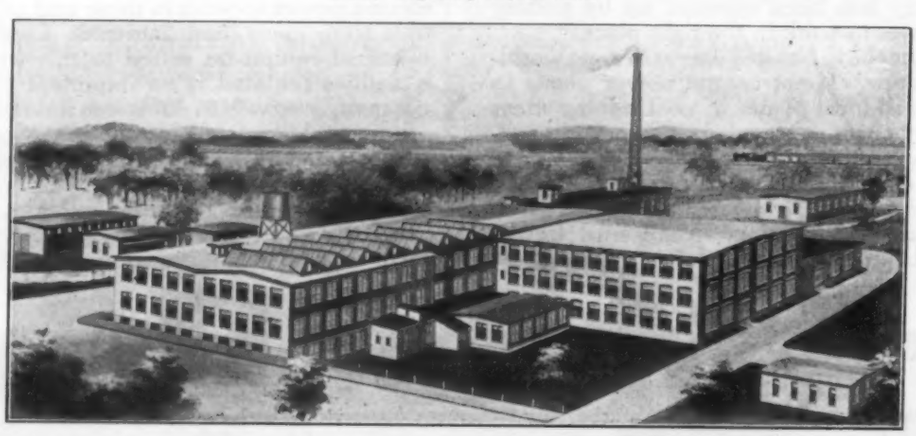
P. B. McMANUS, Pres. and Treas. E. J. McCAUGHEY, Secy. and Mgr.

Home Bleach & Dye Works, Inc.

Established 1881.

Dyers, Bleachers and Mercerizers of Cotton Yarns—in Skein and Warp

Daily Capacity 50,000 Lbs.



PUT YOUR PROCESSING IN OUR HANDS if you want to be sure of results. We have had 35 years of experience in Dyeing, Bleaching or Mercerizing and have every modern equipment operated by skilled employees.
Pure Bleaching for Piece Dye Work. Fancy Colors Dyed to Match Samples. Special Finish. Special Dyeing of Cotton Yarns for Silk Goods in Black and Colors.
Also—Facilities for Winding Cotton Yarns on Paper Cop Tubes for the Shuttle, also on Beams and Cones and Parallel Tubes.

Office and Works at Pawtucket R. I.

AUG 13 1917

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor.

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 for two years; Canada, $1.00 a year; Foreign, $1.50 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The names of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, *notify us*, not the postmaster. Always give the old address as well as the new one.

Copyright, 1917. W. R. C. Smith Publishing Co.

Volume 81. **Member Audit Bureau of Circulation.** **Number 10**

This Issue 5200 Copies.

ADVERTISING IS NOT A WASTE.

Figures Given Out by the Association of National Advertisers Show Low Percentages of Advertising Costs when Compared with Gross Receipts.

The favorite plaint of the business man who has fallen asleep by the wayside is that advertising is a huge economic waste; that millions of dollars are spent and wasted, in artificial attempts to stimulate selling, to the ultimate injury of both buyer and seller. At first glance, and to the man who has not really studied the subject, this argument may appear logical. The only trouble with the logic is that it does not square with the facts. Most people know more things that are not so about this subject than any other under the sun.

"Let us see how much the big advertisers spend," says Alan C. Reiley, President of the Association of National Advertisers, in discussing this matter. "The average man hears talk every day about the millions and millions spent for advertising and he finally gets the notion that somehow or other the buyer has got to pay for it.

"I wonder if Mr. Average Man ever stops to realize that those millions spent in advertising sell hundreds of millions worth of goods—goods that could never be sold so cheaply in any other way. And it is this immense saving in selling cost that helps to make lower-priced goods.

"'Millions spent for advertising' sounds big, but 'hundreds of millions worth of goods sold by advertising' makes the actual amount spent for advertising look small.

"What is the exact ratio of advertising to sales anyhow? This is something that every buyer would like to know.

"I am glad to be able to tell the public. The Asociation of National Advertisers has collected some valuable facts and figures on this subject. Listen to a few of them.

"The advertising of one of the leading paint manufacturers of the country averages 3⅓ per cent of their total sales. In other words, for every dollar's worth of paint they sell, they spend 3⅓ cents in advertising. This is about equivalent to the price of a postage stamp and a cent's worth of paper for every dollar's worth of goods sold. Another big paint and varnish manufacturer spends from 3½ to 4½ per cent.

"Then take the big automobile and tire manufacturers with their full page and double page spreads. Surely now the percentage figures will begin to jump. Will they?

"You will be surprised when I give you the figures for two of the most famous automobile builders in the country. One is 2 per cent; the other is 3 per cent. Also two of the leading tire manufacturers; one spends 2 per cent; the other 2 per cent. And all four rank among the biggest advertisers in the country.

"These figures are authentic, and when you consider the enormous volume of the automobile and tire business you will see that the small percentages are ample to provide for the wonderful publicity.

"And let this final point be remembered. Even if this advertising represented a direct advance on what the buyer would otherwise have to pay, this would make little difference in the price of goods. But it does not. And why not?

"Because advertising is the most efficient method of marketing ever developed by business enterprise—therefore its effect is to decrease and not to increase the sum total of selling cost. This is a simple fact about advertising that every buyer of advertised goods ought to know."

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Machinery Deserves Good Lubrication

The initial cost of good lubrication is negligible when compared with the ultimate cost of poor lubrication.

DIXON'S
GRAPHITE CUP GREASES

have a reputation for quality and service.

A perfect mixture of selected flake graphite and mineral grease is the reason.

Let us know your lubricating problems and we will tell you how to solve them. Write to Dept. 34-R.

Made in Jersey City, N. J., by the

JOSEPH DIXON CRUCIBLE CO.

Established 1827

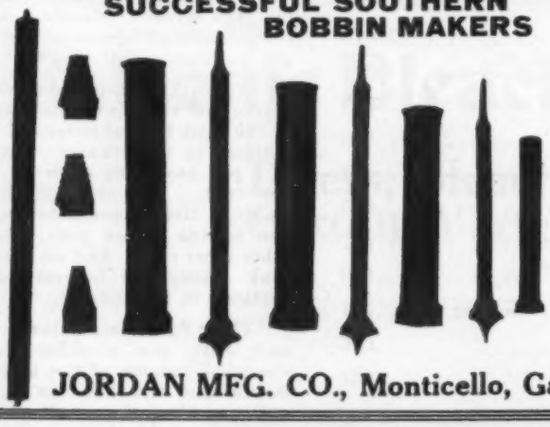
DRAWINGS OF YOUR PLANT

This is a Photo of Our Drawing of the Springstein Mills, Chester, S.C.

WE CAN MAKE A PICTURE LIKE THIS FROM THE ARCHITECTS BLUE PRINTS BEFORE PLANT IS ERECTED

RUDOLPH J. SHUTTING CO. CHATTANOOGA TENN.

SUCCESSFUL SOUTHERN BOBBIN MAKERS



JORDAN MFG. CO., Monticello, Ga.

REASONS FOR ORDERING LESLIE'S

TEMPERED STEEL REEDS

They will weave anything from the FINEST to the HEAVIEST counts.

They will increase the QUALITY and QUANTITY of cloth, and CUT DOWN your REED and SHUTTLE expense.

On receipt of specifications we will send SAMPLE REED FREE of ALL CHARGES.

Loom Reed & Harness Co.

P. O. Box 82 Dept. C Charlotte, N. C.

GARLAND

HERE IS A STANDARD FOR

LOOM HARNESS

Quality

Uniformity in quality is an important feature of our loom harnesses. We not only use the best materials we can buy but make the harnesses with the utmost care and rigidly inspect every harness in the various processes through which it goes. The best materials, care in manufacturing, combined with critical inspection are bound to produce superior harnesses of always uniform quality.

G TRADE MARK

GARLAND MFG. CO.

SACO, MAINE

AUG 13 1917

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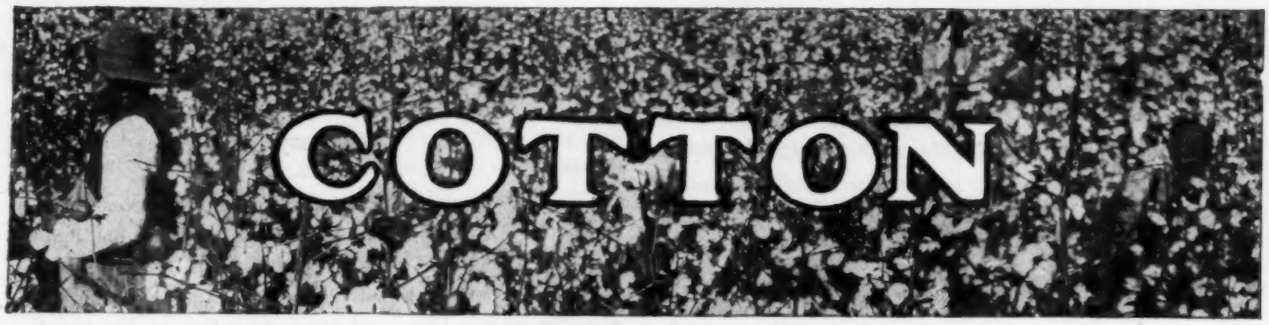


August, Nineteen-Seventeen.

Car Utilization—Cotton Loading.

Moving the cotton crop to the mills this year is going to prove a difficult problem for the railroads, already heavily taxed with war business.

Realizing that it would be difficult for the railroads to carry the peak load at all times and still be in readiness to meet every demand the railroad heads had a meeting in Washington at which they created an organization intended to produce a maximum of national transportation efficiency. In order to give effect to the platform which they adopted, a committee of twenty-seven was appointed, and from the committee of twenty-seven, an executive committee of five, consisting of Mr. Harrison of the Southern as chairman, Mr. Holden of the Chicago, Burlington & Quincy, Mr. Kruttschnitt of the Southern Pacific, Mr. Rea of the Pennsylvania, and Mr. Elliott of the New Haven.

In addition to this executive committee of five, subordinate committees reporting to this committee were created coexistant with the military departments of the government and with individual headquarters in the following sections which they were to serve: The northeastern department, with headquarters at Boston, the southeastern department, with headquarters at Atlanta, the central department, with headquarters at Chicago, the southern department, with headquarters in Louisiana, the western department, with headquarters at San Francisco, and the eastern department, with headquarters in New York, so that there would be a piece of machinery to deal with each departmental commander of the government. In addition to that there were special subcommittees appointed to take up the following general subjects:

A committee on car service composed of seven of the most experienced car men in the United States. A committee on military equipment standards, composed of the most experienced expert mechanical men in the country; a committee on military transportation accounting, composed of the most experienced accounting men to be had; a committee on military passenger tariffs, composed of the most experienced passenger men. A committee on military freight tariffs, composed of the most experienced men familiar with the freight business, and more recently a committee on express, made up of the vice presidents of the various express companies.

General agents were then appointed at all the military headquarters and permanently attached there, with no other duties than to work with the military officers. Also general agents at mobilizing points.

In addition to all this and in order to keep the executive committee in close touch with local conditions in all sections, there were placed under the Commission on Car Service, which is probably the most important of the committees some twenty-three sub-committees located all over the country. This placed a piece of machinery in each state, and several in some states, that can co-operate closely with the shipping and traveling public as well as with the military authorities.

The foregoing is a brief outline of the special railroad organization prepared to coordinate the 250,000 miles of transportation facilities at present in the United States. It should also be remembered that this coordination was brought about through the voluntary act of the owners of these 250,000 miles of railroad, through their boards of directors, for the public good—to help win the war.

The time has now arrived when the cotton factor, the cotton merchant, and the cotton manufacturer may render aid in this coordination of transportation facilities.

The average trading unit in cotton is 100 bales.

The average freight car will hold from 75 bales to 90 bales, depending on the size of the car and the mode of pressing adopted. There are, however, many more 36-foot or 75 bale cars than there are of the larger cars, and this results in from 75 to 80 bales of a 100-bale lot being placed in one car and the small remainder of the shipment going forward in a car of mixed freight. This splits the shipment and while the solid car goes through promptly, the mixed car is frequently delayed at junction points, which in turn causes additional complications at the mill. The result of these difficulties, which frequently defers the settlement for the entire lot of cotton for several days, is the frequent demand on the part of the shipper that the 100 bales be equally divided between two cars, or 50 bales to the car, and then sent through as two car loads. This method produces a great amount of waste space, which, under the present congested condition of the transportation facilities is entirely out of the question.

It has been suggested that the buyers and dealers in cotton change their present methods and trade in unit lots of 75 bales. This means the disturbing of the trading habits of years, but something must be done to aid the railroad managers in so coordinating their facilities that the peak load of the cotton movement may be handled in the best manner for all concerned.

The General Managers Association of the Southeast now has this matter under advisement. The cotton manufacturers are the largest cotton buyers of this country, and should be deeply interested. Any suggestion which may aid in solving this difficulty will be welcome and may be sent direct to Moultrie Hitt, secretary of the General Managers Association at Atlanta, or may be addressed to COTTON.

A Lesson in Thrift.

These are times when everyone thinks in terms of war.

Three years of conflict such as the world has never before seen, and in which the United States is now actively engaged, brings to all a realizing sense of the immensity of the problem confronting us.

A few will be permitted to go to the front and actively participate in the fight. The great majority must stay behind, but still must do their part.

In this war men, metal, machinery and money all occupy important positions, but all are necessary. The 32,726 rounds of ammunition used by the 310 cannon of the federal army during the three-day battle at Gettysburg, could today be used by the same number of guns in about seven minutes; and everything used in the prosecution of war, with the exception of food and clothing, has been increased in about that same ratio.

Because of this vast multiplication of supplies, the cost of carrying on a war has likewise multiplied to a very much greater extent, and it is in the financing of the war that the power of numbers must be felt. This war must be fought on the savings of the future, not with the savings of the past.

We have just absorbed the "Liberty Loan" and are feeling somewhat elated because it was over-subscribed, but —don't lose sight of the fact that this government will need the savings of the wage earner next year even more than it did this year, and perhaps still more the year after.

When we consider the wonderful automatic saving machinery that has recently been established throughout the country in connection with this "Liberty Loan," it seems a great pity to "scrap" this machinery just when it is well oiled and working smoothly, and another writer in this number offers some suggestions along this line which should be seriously considered.

We are reputed to be a nation of somewhat reckless spenders. We make money easily and we spend it in the same way. However, it is now necessary to cultivate thrift, to practice saving until it becomes a habit, that we may be in a position, when called upon, to finance the future war loans the United States is sure to need.

This lesson in thrift also deserves the careful attention of our national law-making bodies as many of the members therein forget that the government needs not only the savings of the wage earner, but also the savings of capital. They seem to be under the mistaken impression that that the government can buy a manufactured product below the market, and then tax away all the profits, if there are any profits, after which capital, as represented by the manufacturer, is supposed to subscribe to issues of war bonds.

Such reasoning is fallacious and "excess profit" schedules such as that outlined in the recent report of the senate finance committee to be applied to the cotton manufacturing industry, can only result in disaster to our business structure.

Jealousy.

Jealousy is the bane of all human existence. It has caused more trouble in the world than any other one known agency; it has ever been a plague upon domestic happiness; a barrier, to social tranquility, wherever it existed, and has proven time over again an influence for the disruption of business relationships.

We can not assign its direct cause. It is an attribute of mind variously conjectured upon. We are often tempted to ascribe it to a presence of the Evil Spirit himself in the minds and hearts of people; while yet not a few contend that it is a species of insanity. This latter contention would seem to possess the quality of reason, as where cause for evil has been discovered, efforts to effect a cure have not been so wholly in vain as have been tactics employed for the correction of jealousies.

Being a psychic condition, and not physical, born of a temperament to distrust, it would seem if not a species of insanity that it should be corrected through the exercise of will power. The theory of insanity being repugnant to our thoughts, rather than accepting it, since some cause must be assigned, let us admit that jealousy is merely mental perversity, practiced as a means by which it is hoped to secure some ulterior end, in disparagement of the one against whom jealousy is directed. Now, could not that condition be corrected by merely reasoning with ourselves? Is it honorable? Is it noble? Is it not even ignoble—contemptible? What does it avail us to be jealous? The purpose we argue here for which jealousy is practiced, is never realized. It is a delusion and a snare. It does not correct any grievance, either real or fancied, but to the contrary only intensifies it. No one has superior rights to another in the enjoyment of what each has, and any one who would cringe before the jealous maneuverings of another, and yield any personal right, is a weakling. The vaporings of the jealous, therefore, become "as sounding brass and tinkling cymbal." They are invariably met with righteous rebuffs and prove boomerangs for self-destruction of happiness.

Let us guard against any tendency of mind toward jealousy.—*The Fulton.*

If you wish to acquire a reputation as a profound thinker, be prophetically alarmed about the future of our fair country. Express concern at the increase of crime, at the interminable grafting of politicians, at the menace of socialism, at the perils of capitalism, at the consequences of disarmament or at the sanguinary results of preparedness. It matters not what alarms you, as long as you are alarmed. Your prediction that dire calamity will strike the country in the indefinite future, will stamp you as a man of extraordinary intellectuality. Your position is safe, my son. If calamity comes, you will be a proven prophet; if it does not come, you will never be refuted, for the indefinite future never refutes.—*Parks Piping Parables.*

Automatic Saving.

BY HERBERT N. FELL.*

The authorities at Washington have furnished the nation with a concrete example of the forehandedness of thrift. To show his patriotism, the wage-earner buys a fifty dollar Liberty Bond, and in order to pay for it, allows his employer to deduct from his wages five dollars a month for ten months. He does not see the five dollars, does not handle it, but he gets the bond at the end of the ten months.

This is automatic saving, and the time is coming when it will be practically the only kind of saving for the wage-earner. With the competition of the omnipresent salesman and the alluring temptations held out on all sides to spend for pleasures and luxuries, not to speak of necessities, the ordinary man finds it next to impossible to save except automatically, that is to say, by agreeing to allow so much of his wages to be held back and accumulated in a permanent fund.

The need of individual saving was given no thought in England or Canada during the first year of the war. Now both countries are extensively advertising that the only way to win the war is through the thrift of the individual worker.

The average man somehow feels it incumbent on him to spend his weekly wage by the time his next pay-day has rolled round. The microbes of etravaganee has got into his blood, and he feels uneasy if he has anything left. He doesn't feel the necessity of going to work until he needs the money.

This slipshod economy is likewise characteristic of Americans who are independent of wage earning. They live on their capital. If they make $50,000 a year, they live up to it. This may not be literally and universally true, but it is at least figuratively true, and it illustrates one of our common failings.

Workers in this country, for the most part, draw their wages weekly or monthly. It comes easier to spend these earnings than to deposit them. To save requires a strong will, and prosperity has a tendency to detract from this particular form of will-power. There is not one man in a hundred, perhaps not one in five hundred, who responds to the advice to save. They must be educated to it—must be shown its mathematics, its possibilities. The majority of young people fail to visualize or to forecast those vicissitudes which sooner or later will overtake them in life, when the calls on their income will prove beyond its capacity.

Let us suppose that the young man of twenty-one starts out with an annual income of $1,000. If he puts by five per cent of this, or fifty dollars a year—and surely he can spare that much—this small sum, with compound interest at five per cent, will net him at forty-one $1,735.50. If he can put by $100.00 a year, he will have doubled this sum, say $3,471. If his salary or income has increased beyond the $1,000 mark, he may be able to put aside more. If, for instance, he is getting $1,500, and puts aside five per cent of this, or $75 each year, he will have at the end of twenty years $2,503.25. And if he should continue this habit for forty years, or the span of his working life, he would have saved $9,513.

*President, Fell & Co., Ltd., New York.

If a young man can save five per cent of his wages for twenty-five weeks, he can save it for fifty weeks, or fifty-two weeks; and if he can save it for fifty-two weeks this year, he can save it for fifty-two weeks next year.

I know of factories that have orders to keep them going seven days in the week, if the management felt so inclined; but they find it impossible to get their men to work more than five days. Owing to the present high wages, they are making enough to keep them, and they are interested only in spending. They have not been taught the importance of saving. Get them interested in saving rather than in spending, and they would work eight days a week, if the calander permitted.

Money-saving is a great conservator of health. It means that the one who saves his wages will become a saving individual in other respects. He will save his employer's time and his own time; he will save his energies, his efficiency; and he will work more steadily. He will lose less time because of ill-health. He can defy the demon of worry, and worry means disease.

Some employers have gone so far as to say to their employees, with their consent: "We will not pay you wages. We will deposit the money in bank. When you need the money, you can draw against it."

At 50, the man who saves will not regard himself as old. He will not be old. Whether he has saved a thousand dollars, or two thousand dollars, or five thousand dollars, he knows he is providing a competency for old age, and he looks hopefully to the future. Despite Dr. Osler's alleged theory, he can work until 65, increasing rather than decreasing in efficiency during the intervening years. Whereas, the man who has saved nothing at 50 is a self-confessed failure, and is looked upon by his friends as a failure. His efficiency is constantly deteriorating.

And whether the wage-earner puts his money in bonds, or whether it goes into other securities, whether it goes into savings banks or life insurance, it is going to find its way to the government, if the government needs it at any time; and both government and citizen are better off.

The average man does not make money easily, but he can easily save a portion of what he does make, and by doing so acquire a habit which will pay dividends. It will save him many a nervous hour, and tend to worriless old age.

Book Reviews.

THE ANILINE COLOR, DYESTUFF AND CHEMICAL CONDITIONS FROM AUGUST 1ST, 1914, TO APRIL 1ST, 1917, is the title of a new book compiled by I. F. Stone of the National Aniline and Chemical Company. 224 pages, bound in cloth.

This book was compiled at the urgent request of many friends of Mr. Stone among the chemical and other scientific societies as well as among manufacturers and others interested in the development of the coal tar products and the chemical industry in the United States. The book contains much of interest and value, and will be of especial service to those societies, universities, libraries, etc., who wish a book of reference on these subjects. It forms a very useful souvenir of the conditions that arose as the result of the European War, and manufacturers will find this volume well worthy of a place on their library shelves.

The Pink Boll Worm.

Like the famous horse of Troy, it is now intimated that the pink boll worm may not be the destructive pest that the reports have made it. At least, the suggestion comes from Mexico that its ravages in the Laguna district are nothing like what might have been expected. An explanation of this may be forthcoming later from the experts, however, and it is gratifying to know that the United States authorities are prosecuting persistently the campaign to keep the insidious "Greek" out of this country. The only basis for the "suggestion" that the pest is not maintaining its record for destructiveness, in connection with the Mexican crop of cotton, is that the yield promises to be the largest on record, probably 125,000 bales, in the district where the pink worm has established itself. However, it would not be well to place reliance upon this as evidence that the pest is less dangerous than it was.

Meanwhile, a drastic step is still up for consideration by the United States government, i. e., the establishment of a prohibitive to cotton-growing zone to border the Rio Grande and extend to the interior of Texas about 100 miles. This move will not be made except as a last resort to save the situation, according to reports from a conference at Washington of seven men representing farmers and business interests of the lower Rio Grande region in Texas with representatives of the United States department of agriculture. The assurances to this effect were given by the specialists of the department mentioned. On the other hand, it is pleasing to note that the Texas representatives said that the farmers would be willing to make the sacrifice of a crop worth several millions of dollars if it be the only way to keep the pink boll worm away. In the event such action is taken, the department is pledged to assist the farmers in developing substitute crops for cotton in the contemplated zone.

Following the conference, officials of the department of agriculture and of the state of Texas met for discussion of the details of methods by which the pink boll worm is to be kept out of the country. One possible source of relief from the proposed zone in the United States would be a prohibitive area on the Mexican side of the Rio Grande. It was recommended, at the conference in question, that the authorities get into touch with officials of Mexico and see if a prohibitive area on the other side of the river could not be established, as little cotton would be affected there, so the loss entailed would be greatly minimized. The hitch here would be to secure the cooperation of the government in Mexico.

While growers in the proposed area in Texas would lose a profitable crop, a sacrifice which means safeguarding the entire cotton-growing belt of the United States from a pest like the pink boll worm should not leave these farmers long in doubt as to the course to take. Happily they have pursued that course and it is to be hoped that they may be spared the loss of their cotton crops. On the other hand, diversification of crops is a thing which the South has been preaching for a long time, not without good reason. It is asserted that, if these particular farmers are forced to discontinue the cultivation of the great staple, the loss entailed could be compensated to a large extent by devoting the land to other crops. The offer of the department of agriculture of assistance, moreover, makes the conditions even more tolerable, as these farmers might find it necessary later, under other conditions, to diversify.

Notwithstanding the denial of some cottonseed oil manufacturers of Mexico that the worm exists in Mexico, scientific experts of the department of agriculture and of the Texas state department of agriculture cling to their statements, based upon research, that the pest is there. Not only so, but they say it may reach this country in full force at any time, if immediate preventive action is not taken. One of the experts who has studied and investigated the matter is Professor Eduardo Gonzales Tajada of Monterey, who spent eighteen months in research in the Laguna district around Torreon and San Pedro, state of Coahuila. His report to the Texas state department of agriculture on the extent of the depredations of the pest is worthy of careful scrutiny by anyone tempted to make light of the dangers of the worm.

It is not definitely known when the pest was introduced to Mexico, he says, but it is believed to have reached the country perhaps several years ago from Egypt. It is thought to have made its way, by degrees, or through the shipment of cotton seed for planting purposes, into the Laguna district. The first appearance in that district seems to have been in 1915, when some damage was done to the cotton crop there. It had multiplied in 1916 so greatly that it covered practically the entire district and caused a loss of 50 to 75 per cent in staple and approximately the same ratio in seed. Another expert says that, should the pest once make its appearance in this country, it would be almost impossible to stamp it out. An ounce of prevention will be worth several pounds of cure, it would seem.

According to this latter authority, the eggs of the moth of the worm are deposited on various parts of the cotton plant and they hatch in about ten days. The minute larvae feed on the leaves for a short time, but very soon penetrate the interior of the boll. The insect spends about 20 days in this state, reaching a size of about one-half inch long. It goes then to the pupa state, lasting about fourteen days, then changing to a moth. When ready to transform to the pupa state, it occupies the hull of the seed, of which it has devoured the kernel. The moth is of a grayish brown with dark blotches and is about three-quarters of an inch long. Its life is about ten days. It begins depositing eggs in three or four days after emerging from the chrysalis.

It is a well known fact that some latitude for the settling of the roof under the weight of snow and ice and for the expansion of pipe lines supported by brick piers, or other methods far below the roof level, must be allowed for in fitting flashings. If these are too closely drawn or capped, trouble will soon follow. The Holt roof vent and leader connections, which are manufactured and sold by The Barrett Company, New York, are made entirely of copper and cast iron and therefore it insures service as lasting as any part of the roof, and besides provides a flexible connection, made possible by an expansion joint fitting, which is entirely lacking in the usual form of roof or leader connection. The Holt connection is designed for use with any kind of a flat or nearly flat roof construction, of gravel, metal, inlaid slate, tile or felt, and for any place where vent pipes, leader lines, steam stacks, flag poles, or any other fixtures passing through the roof require flashings. A detailed description of the Holt connections may be secured on application to The Barrett Company.

The Second Southern Textile Exposition

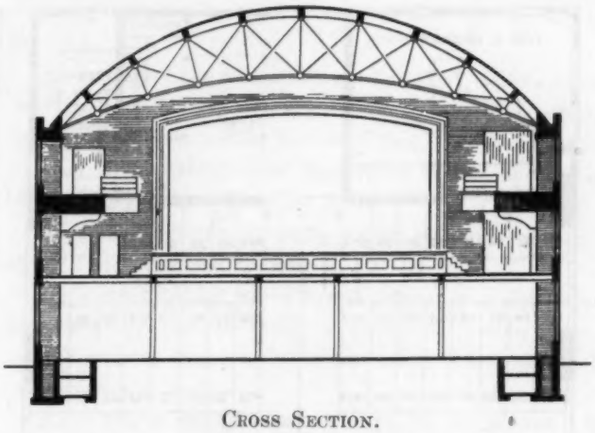
The dates set for the Second Southern Textile Exposition at Greenville, S. C., are November 12th to 17th inclusive. The new building is well under way, the heavy concrete foundations and the concrete heating and ventilating ducts having all been placed. The work on the reinforced concrete columns is progressing, and the material for the entire building is arriving daily. While the dates set are somewhat tentative owing to the heavy load on transportation facilities and the unprecedented labor conditions caused by the war, still these are the best estimates of those in charge of the work, and it is very doubtful if any unforeseen occurrence which may arise will delay the opening of the exposition more than two weeks at the most.

FRONT ELEVATION.

Applications are being rapidly received for space reservations, and at the time COTTON's representative was in Greenville, nearly 70 such applications had been booked, some of them for very large quotas of space. At the time of the 1915 exposition there were a number of disappointed manufacturers owing to the fact that they neglected to reserve space early enough to get into the show, or, as was the case in some instances, they were led to believe by persons unacquainted with the conditions existing at that time, that the exhibition could not become the success that was predicted.

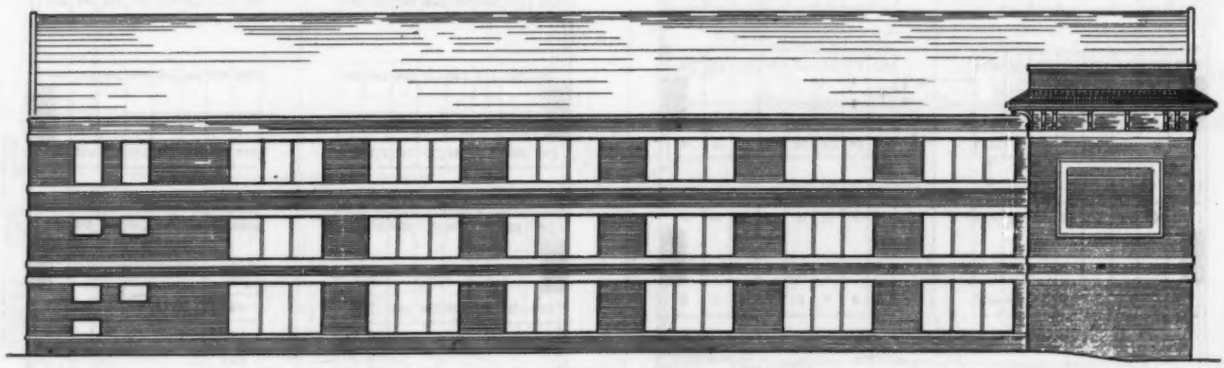
As a matter of fact, the 1915 exposition was a preordained success from the start. Now, when it is remembered that the past year has been the most prosperous year within the history of the textile trade, and when consideration is given to the immense advantage to be had by this Second Southern Textile Exposition through the medium of its new and adequate building, with its greatly improved exhibition facilities, including a more ample space, it will at once become apparent that this second textile exposition is to become an even greater success than was the initial show of the Southern Textile Association in November, 1915.

Appreciating the many benefits to the city of Greenville arising from the Southern Textile Exposition being held at that point from time to time, the citizens of the city of Greenville are subscribing to a fund amounting to $10,000, which is to be devoted to the purchase of a large pipe organ to be installed in the auditorium of the textile building and presented to the corporation. It is understood that the subscriptions for this purchase are practically completed and arrangements are being made to carry out the intentions of the originators of this idea.



CROSS SECTION.

We take pleasure in presenting herewith, reproductions of the plan and elevation of the exposition building, as well as a brief description of its construction and some of the tentative rules governing the exposition as outlined for a prospectus to be issued by the officers of the exposition at about the same time that this number of COTTON goes into the mails.



SIDE ELEVATION.

Applicants for space should make at least six selections, numbered in the order of their preference. They should state the classes of goods to be shown, or the kinds of exhibits, and state the space to be occupied by each, and the

various connections required for light, power, water, waste and gas.

Each exhibitor will be required to show all of the articles described in his application, failing which the management may, at any time after the opening hour, allot any vacant space to such other applicant as may be deemed proper.

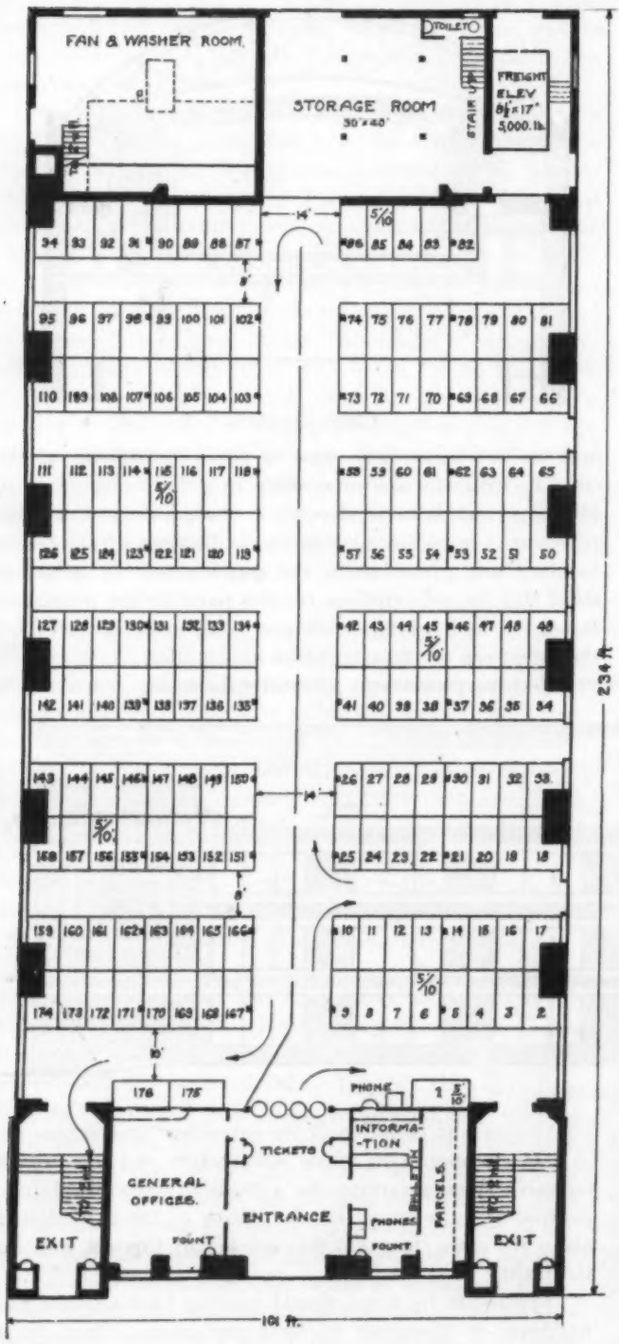
Special attention is called to the location of the several departments.

Department A is for the exhibit of all kinds of moving machinery and exhibits which cannot be handled by the elevator. Floor load, unlimited. This department embraces the entire first floor, sections Nos. 1 to 175 inclusive.

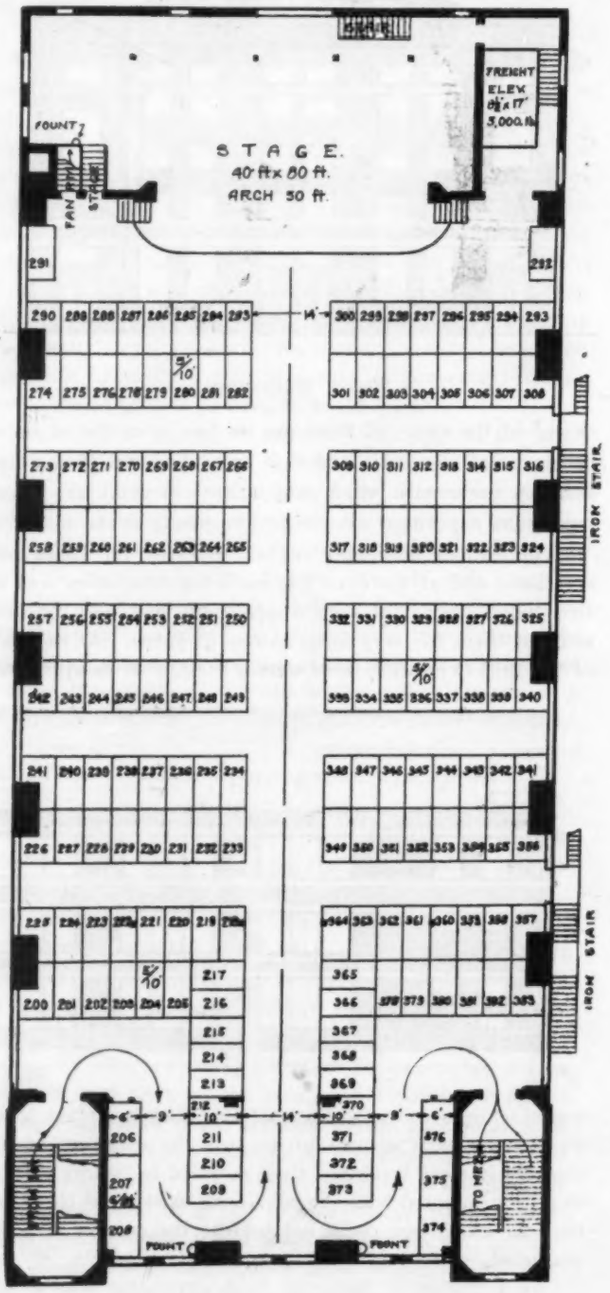
Department B is for still machinery, comparatively noiseless machinery (which cannot be assigned to the first floor), all kinds of supplies and building materials. Floor load, 150 pounds per sq. ft. This department includes the entire second floor, sections Nos. 200 to 383 inclusive.

Department C is for textile fabrics and supplies, which require wall space for their display. Floor load 150 pounds per sq. ft. This department occupies the entire balcony, sections Nos. 500 to 583 inclusive.

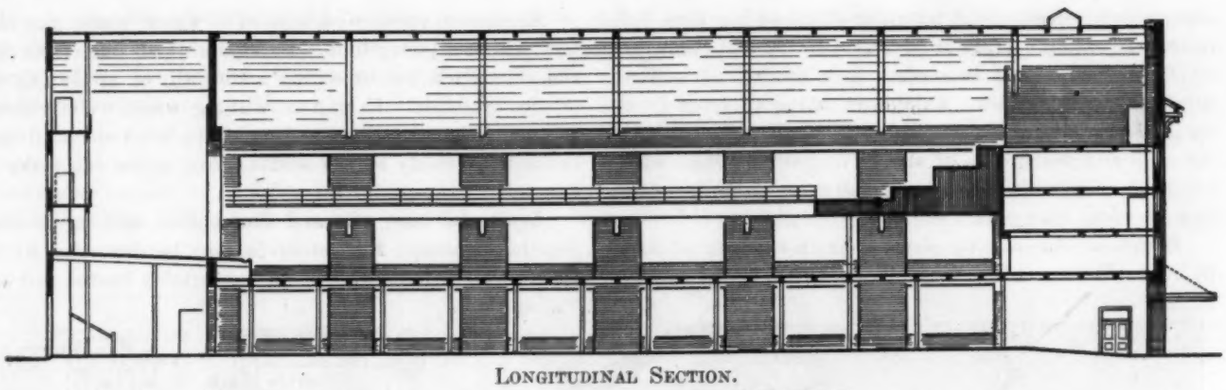
Department D is for any kind of exhibit whatever, but will be specially reserved for exhibits calling for the use of smoke flues or moving picture machine connections. Its seating capacity when thus arranged is 300. When thus used the movement of the visitors will be switched by and not through this space. This department is located on the



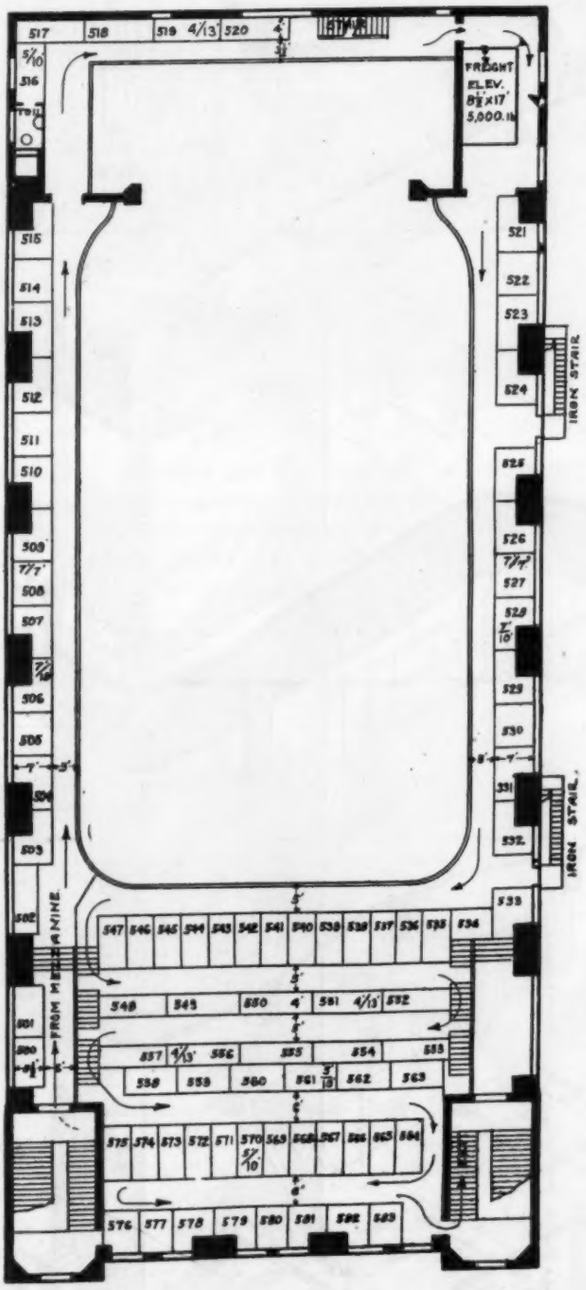
FIRST FLOOR



SECOND FLOOR



LONGITUDINAL SECTION.



BALCONY FLOOR

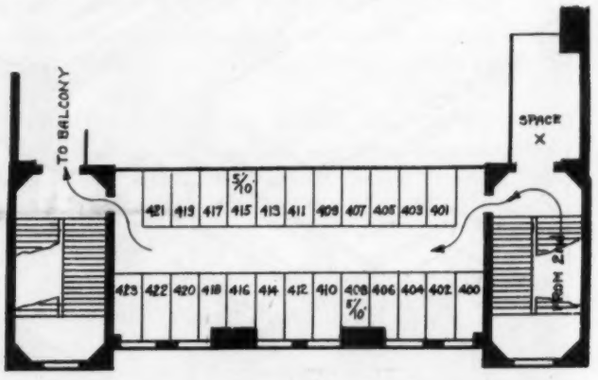
mezzanine floor and contains sections Nos. 400 to 423 inclusive.

Arrows show the continuous movement of visitors in one direction. Neat rails dividing off any number of sections into a single space will be furnished free. Irregular shaped sections have slightly more than rated spaces, but all are charged for on the basis of 50 sq. ft.

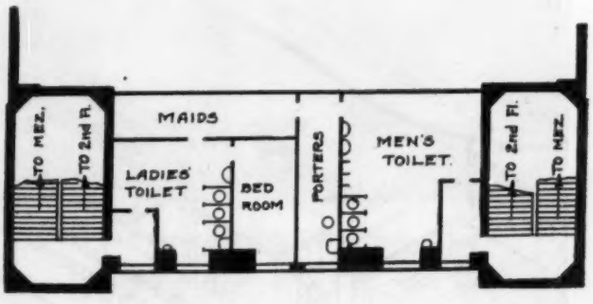
Floors are entirely of maple except sections Nos. 1 to 9 and 167 to 175, which are cement.

Rails are provided where desired, these being either double or single of stained wood. The exhibitor will be allowed to tack cloth to these enclosing his space. Cloth should be in 36 inch widths.

Floor spaces are all rated at 50 sq. ft. per section. All contain this much less 10-inch square columns (where col-



MEZZANINE FLOOR



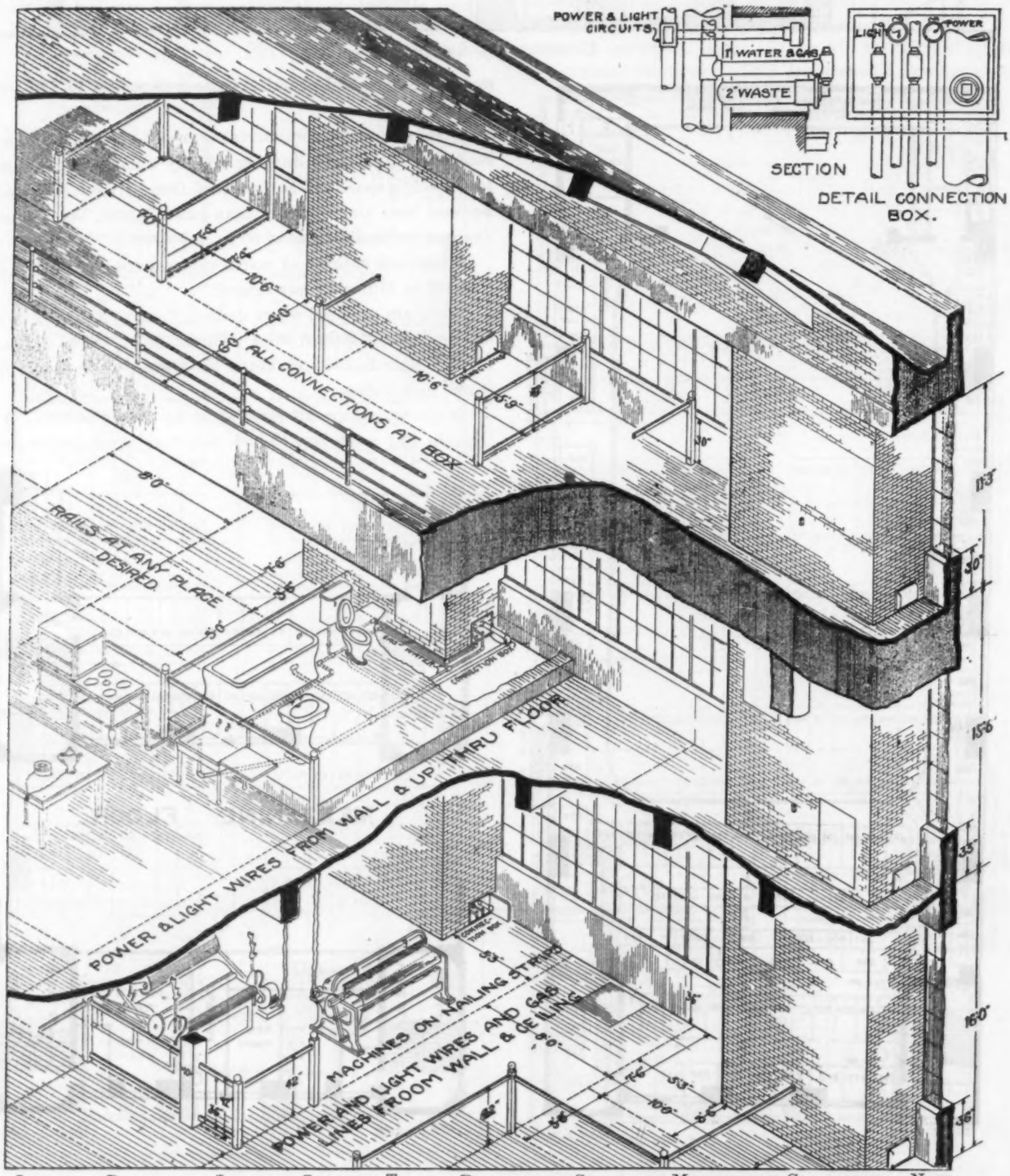
MEZZANINE FLOOR

umns occur). Sections of irregular shape or less than 5 ft. in any dimension contain from 2 to 5 sq. ft. additional, for which no charge will be made. Any number of sections may be thrown together. Exhibitors taking all space fronting on both sides of a cross aisle will be permitted to close the aisle and use it free of charge if desired. Main aisles are 14 ft. wide with division rail, and cross aisles are usually 8 ft. wide. See plan.

Elevator. The electric elevator has a capacity of 5,000 pounds. The car is 8½ ft. by 17 ft. with a height to beam of 12 ft.

Mechanical connections consist of water, waste, gas, electric light and power lines. Extension of all lines from special connection box or ceiling mains will be at the expense of the exhibitor. Exhibitors wishing waste water connections should secure space as near wall piers (which all have connection boxes) as is possible. Any space can make all connections except for waste water.

Light and heat. General illumination will be provided for the building. Special drops may be connected by exhibitors. The building will be comfortably heated and well ventilated.


POWER & LIGHT CIRCUITS
1" WATER & GAS
2" WASTE
LIGHT
POWER
SECTION
DETAIL CONNECTION BOX.
ALL CONNECTIONS AT BOX
RAILS AT ANY PLACE DESIRED
POWER & LIGHT WIRES FROM WALL & UP THRU FLOOR
MACHINES ON NAILING STRIPS
POWER AND LIGHT WIRES AND GAS LINES FROM WALL & CEILING

ISOMETRIC DRAWING OF INTERIOR, SHOWING TYPICAL DIVIS ION OF SPACE AND MECHANICAL CONNECTION. NOTE THE "CONNECTION BOX" WHICH OCCURS AT THE END OF PIER.

One quarter the amount charged for space is to be paid upon receipt of notice that the application for space has been accepted. The balance of payment for space is to be paid on or before Nov. 1, 1917.

During the show and for two weeks prior thereto, a representative of the management will be at the Bureau of Information, located in an office near the main entrance, where information on any matter may be obtained.

It is expected that all exhibitors will arrange their exhibits between Oct. 29th and Nov. 10th and have their exhibits ready for the public by Monday morning, Nov. 12th. No carpentry or other work that will make a noisy labor of any sort will be allowed after that hour.

A FEW OF THE STEEL SASH AT THE LEFT; MOST OF THE TIMBER AT THE RIGHT IS ALREADY FRAMED.

Attention is called to the decorations and signs of the interior of the building. No decorators or sign painters other than the official decorators and sign painters will be allowed to do work in the building.

BUILDING THE CONCRETE PIERS.

It is understood that the lessees will not sublet any part of their space or allow to be exhibited therein any other articles than those manufactured or sold by the party to whom the space is allotted.

During the progress of the exhibition, business between the exhibitor and management shall be conducted through one properly authorized representative, and through no other person. Each exhibitor must designate prior to opening the name of the person who will be in charge of the exhibit. The management may not accept or issue any order, or contract any business on account of an exhibitor except upon the written or personal request or application of such representative.

The management reserves the right to decline or prohibit any exhibit, exhibitors or proposed exhibits not approved by the management, and to permit only such matter and conduct as shall be approved of by the management. This reservation covers persons, things, conduct, printed matter, souvenirs, and emblems, and all things which affect the character of the exhibition.

The exhibition will open Monday Nov. 12, 1917, at 3 p. m., and will be open each and every day thereafter from 10 a. m. until 10 p. m. until and including Saturday, Nov. 17, 1917. General admission to the hall will be 25c. No return checks.

PILES OF MATERIAL FOR THE EXPOSITION BUILDING.

A copy of the prospectus in full, with application blanks for space may be secured by addressing the Southern Textile Exposition, Inc., or Thomas R. Riley, assistant secretary, at Greenville, S. C.

Following are the officers and directors of the exposition:

Officers—President B. E. Geer, Greenville, S. C.; vice president, Ellison A. Smythe, Greenville, S. C.; treasurer, Edwin Howard, Greenville, S. C.; secretary, G. G. Slaughter, Greenville, S. C.

Directors—W. P. Anderson, A. B. Carter, F. Gordon Cobb, B. E. Geer, Jno. A. McPherson, J. E. Sirrine and T. B. Wallace, all of Greenville, S. C.; Z. F. Wright, Newberry, S. C., and J. M. Davis, Newberry, S. C.

Some Qualification in Cotton Grading.*

BY F. GORDON COBB.†

By way of explanation, let me say in the beginning that this paper is not intended as a technical paper at all but rather a practical paper which I hope will give the technical expert food for thought.

I do not claim to be a cotton grader from a commercial standpoint but the varied experience I have had for eighteen years trying to produce yarn and cloth from the many grades of cotton I believe has given me some idea as to what kind of cotton will spin best in a cotton mill.

I believe that any man who is expecting to go into the business of buying cotton should endeavor to learn something about the spinning of cotton.

The cotton buying business is far from that final stage of improvement in regard to buying cotton for spinning purposes and we need have no fear of having to go into minute details to find ways for improvement.

I do not believe that men engaged in any other business are working so far from each other's interest as the cotton buyer and the cotton consumer. For illustration: The physician or doctor is very closely allied with the drug business because he knows the practical side of the composition of the drugs and therefore knows what the different grades of drugs will do.

The shoe manufacturer is also very closely allied with the leather manufacturer. The shoe man knows the exact grade of leather he must have to put into shoes for the laborer's feet. Also, the proper grade to produce the finest vici for the lady.

Now, honestly, can any one of you cotton men here before me say that you know what grade or kind of cotton will produce a piece of print cloth with the greatest net return to the mill?

You will probably reason to yourself that good middling cotton would certainly be better for any mill than middling, then the first question I would ask you when you say that, is: *"What Kind of Good Middling Cotton?,"* which, no doubt, would sound like a foolish question to you. However, that is the main point I am going to try to bring out, viz.: that there are several kinds of good middling cotton from a spinners standpoint.

To illustrate again: Suppose you place before me 200 samples, 100 of them good middling and 100 middling, have them pretty well mixed up and ask me to select the 100 bales that I had rather have to spin in the mill. In some cases I would probably pick out as many middling bales as good middling. Do not understand me to say that would always be the case; but I do say it would often be so. I have tried this test on boss carders so many times that I know it is a fact that often times a mill man had rather have certain kinds of bales of *middling* cotton than other certain kinds of *good middling* cotton.

If I say it another way probably it will be more clear to you: Very often the samples of *middling* cotton will have the very same character of staple, also that oily, mature feeling which mill men so much desire in cotton, and most important of all the same *length* and *strength* of staple as the *good middling*. Therefore, there is no reason in the world why it should not spin just as well as the good middling.

Do not confuse what I say with the lower grades of cotton, because this reasoning would not apply.

Of course, in making some classes of goods the cotton buyer is instructed as to the grades of cotton he must purchase on account of the appearance of the finished cloth, but there again he is buying entirely by the commercial grades, having no thought whatever as to its spinning qualities.

The vast majority of the spindles where cotton is grown are making yarns for the plain grades of cloth, such as prints, drills, sheetings and percales, therefore we may confine our reasoning to grades of cotton best suited for this class of goods.

Now, to go back to my statement that the cotton buyer and the cotton consumer are not working towards each others interests, let me cite one fact with which most all mill men are more or less familiar, and if you will go to some of the mills when the cotton season opens you will see I am right.

Many mills own large ginneries and buy practically all the cotton they gin. At the first of the season especially, when the top cotton or first opening is coming to the gin, they buy hundreds of bales that will go fully two grades above what the local mill men know is necessary for maximum production in that mill. It is very easy to demonstrate that fact by going over the production records of the mills and noting whether there is any material difference in production when they are using good middling and above or later in the season when they are down to a middling average. Understand, now, this is cotton which all comes from one section and has the same length and strength of staple. There are many of these mills (which have gins) that are making the plain styles of cloth such as prints, drills, sheetings and percales and those mills are consuming thousands of bales of cotton every year that could be put into the finest lawns. Then why would it not pay these mills to have an expert cotton man who could assort these fancy grades and sell them to mills which *must* have the high grades of cotton to make the fine numbers they are spinning, and then re-purchase cotton of the proper grade to produce the prints, sheetings, or drills such as they are making, and let the difference in price swell the dividends of the mill?

Any boss carder knows that many bales of cotton which have enough fine leaf or stain to throw them off a grade will spin practically as well in a mill on medium counts as bales that will go a full grade higher, because the fine leaf or stain they carry has not hurt the *strength* or *length* of the staple.

Of course there will be some difference in the waste,

*Extracts from a paper presented at the Technical Textile Conference at the Bureau of Standards.

†Superintendent F. W. Poe Mfg. Co., Greenville, S. C.

but it is nothing compared to the difference in price. I can show you results of tests I have conducted that will confirm this statement.

Now when you go below *low middling* and strike the grades which carry so much heavy foreign matter, immature fibre and short staple, you seriously hurt the production of a mill that tries to spin them.

In North Carolina, South Carolina, Georgia and Alabama there are practically twelve million spindles and those spindles are producing about an average of one and one-fourth pounds of yarn per spindle per week. Now, I know that stating information containing many figures is monotonous; therefore, I state briefly, that from information I have compiled I feel confident I am speaking conservatively when I say that these twelve million spindles are using enough cotton of higher grades than necessary for their maximum production, which, if sold at its market value and the proper grades purchased, the differences in price would build a nice size cotton mill every year. In other words, American mills are using grades of cotton that are worth many thousands of dollars more than the European mills are using to produce the same styles of goods, which bring just as much as our cloth does, when placed on the counter for sale.

Another rather strange fact is that when cotton advances or declines one-half cent per pound the *mill* cotton buyer will talk about it as unconcerned as he talks about the weather—but just let the cost of production in the mill go up one-half cent per pound and the superintendent does not get a chance to talk about it—he gets fired.

To sum up the main points I have tried to bring out to you, speaking entirely from the spinners side of the question—but before I do that, let me caution you not to misunderstand me to say that mills are using good middling when they could just as well use middling, No! No! several time no; that is not my contention at all, because I am well aware of the fact that any mill should use a grade of cotton that will give the maximum production from its machinery, consistent with the best possible grades it can afford to buy to make the class of goods its looms are on. However, there *are* thousands of *good middling* bales being used as middling bales, especially where the mill owns the gin or is buying from gins located closely to them.

Also, we have shown that many middling bales will spin as well as some good middling bales and that the middling grade is suitable to make the goods that particular mill is making, therefore, my prediction is that some cotton man is going to get these facts into concrete form and establish a system whereby his customers will profit by his knowledge of buying cotton to *spin* instead of buying by the commercial grades. And when he does, he will have placed the American mills a long step forward and, incidentally, he will be able to write his personal check in seven figures.

The advantages resulting from the use of automatic starters for induction motors comprise, absolute protection to both operator and expensive machinery, proper starting at the most rapid permissible rate, economy in operation and maintenance, convenience of remote control, and automatic operation.

The Mill Yard Transportation Problem.

BY A. M. OLIVER.

The expense of transportation, where there is an infinite variety of weights and sizes to be moved through a moderate distance, often involves high labor cost and the use of many vehicles.

The human element, particularly the drivers and caretakers, may be the most important factor in the operation of the trucking or delivery service. In general, abuse should be avoided in the operation of any vehicle. The horse should not be driven too fast or too far, nor should the motor truck be overloaded, overspeeded, or run without proper inspection. Even if a company's executives order that abuse will not be countenanced, obedience of the order depends chiefly upon the operatives because it is very difficult to learn of abuse until after permanent injury has been done.

In some service it is understood tacitly among the drivers that a certain number of trips or deliveries constitute a day's work. If this quantity of work can be done conveniently by a horse wagon, a motor truck is almost precluded. But in general the substitution of motors for horses may be expected to speed up the movements of the driver, on account of the higher speed of the automobile. This acceleration tends to decrease the standing time for loading and unloading. Such a tendency has been noticed, especially in observations taken upon horse and motor trucks used in mill yards.

The amount of work which any truck can do in a working day depends, first, upon the number of miles it is driven in a day, and second, upon the standing time or time taken in loading and unloading. As an illustration, consider a horse-drawn wagon which travels fifteen miles per day but which is actually moving only three out of nine hours; the average speed of the wagon therefore being five miles per hour. If this wagon is replaced by a motor truck of the same carrying capacity, whose average speed under the same traffic conditions would be ten miles per hour, then the motor truck could cover this same distance of 15 miles in $15 \div 10 = 1.5$ hours, but if the loading and unloading conditions remain the same, the time required to perform the same service would be $6 + 1.5 = 7.5$ hours. That is, in 9 hours the motor truck could do only $9 \div 7.5 = 1.20$, or 20 per cent more work, although its speed is twice that of the horse wagon. This point is frequently noticed in work about mill yards, where the hauls may be comparatively short, but where facility in reaching inconveniently situated platforms may be exceedingly important. The influence of the driver's mental attitude, as noted above, may also shorten the standing time of the motor and thus increase its quantity of work per day.

As a means for reducing the cost of handling transportation under various conditions it is advisable to install a system whereby the head of transportation can be assured that the work is laid out properly; that a two horse team with four men haven't been sent half a mile to move a beam that weighs 25 or 30 pounds; that a single truck with two men hasn't been sent to empty a car of cotton.

The first step, which step I believe is the most important, is to centralize the transportation or dispatching office.

Arrange to have all teaming orders come to that office. Do away with all branch offices or second-hands around the yard and instruct the overseers and foremen of the different departments that every team order must be telephoned to the dispatching office. The use of but one form is necessary (see illustration.) This form will show the department and door at which the articles to be moved are located, the department and door to which they are to be delivered, the nature of the material and the time the order was received and finished.

The clerk in the dispatching office will arrange the orders according to the time they were received and will fill them in the proper order. A teamer will be given two, three or four orders, depending on the direction in which the materal to be moved is located and will proceed to move the material mentioned on his orders. The time of completion is stamped on each order as soon as it is returned by the

TEAMING DEPARTMENT

MR. _____

PLEASE TAKE FROM

_____ DEPT. _____ DOOR

AND DELIVER TO _____ DEPT.

_____ DOOR, THE FOLLOWING:

_____

_____

_____

_____

_____

ORDER REC'D. FINISHED TEAM NO

_____ A.M. _____ A.M. _____

P.M. P.M.

teamer. A teamer will refuse to move anything other than the articles listed on his order. If the order reads 10 rolls of cloth he will move 10, but he will not move 20 rolls. If there are more than 10 rolls the overseer will telephone the dispatching office again and the balance will be moved in the proper order as stated.

One clerk in a dispatching office will handle the orders of any concern no matter how large and will do it efficiently. No orders will be forgotten; an order received at 4 P. M. will not be filled before an order received at 1 P. M. The teamers will have no chance to soldier for they are timed at all times. They are unable to hang back and loaf in order that they will receive no more orders that day. They will be obliged to turn the orders in as soon as completed, otherwise the head of transportation will demand an explanation for the delay. No second-hands or foremen are necessary in the teaming department. A teamer has his orders with him at all times and he knows exactly what is expected of him.

Another good feature about this system of handling transportation is the fact that the clerk in the dispatching office knows just what kind of a team to send to fill each order. He will not send a two horse team with four men to the superintendent's house to get an American flag—he will send a light delivery. It costs less, the job is done more quickly and much less power and energy is used. An overseer can't complain if there is no ground for complaint. If he says he put an order in at 10 A. M. and at 4 P. M. it wasn't filled, the dispatching clerk can show him that he didn't put his order in until 2:10 P. M.

This system of handling transportation is a plan that I have installed in three different mills and after a thorough test I find that it stands up under the strain when other methods fail.

Automatic Starters For Induction Motors.

Due to the unprecedented demand for manufactured products of every kind, industrial plants in all parts of the country are being taxed to their utmost capacity. In addition, the cost of labor and machinery has been increasing at an extremely rapid rate. The magnitude of these factors has forced manufacturers to employ every means available in an effort to increase production or to reduce operating expenses. This may be accomplished by reducing the number of operators, by simplifying the duties of the present operators so that more attention may be devoted to the production of a larger quantity and a higher grade of product, or by furnishing better protection to the apparatus installed, thereby, insuring continuity of service.

One of the chief factors by which the desired results may be accomplished is the use of automatic starters and controllers for the motor driven machinery employed. Among the companies producing such control apparatus is the Westinghouse Electric & Mfg. Company at East Pittsburgh, Pa. These automatic starters are for use with single phase or polyphase squirrel cage and wound-rotor induction motors, where it is desired to start the motor from a remote point or where automatic acceleration is required to guard against improper starting by unskilled operators They are simple, reliable, and rugged in construction, consisting of a magnetic contactor panel and a master switch, which may be either a push button, a float switch, a pressure regulator, or similar device for closing the control circuit, depending upon the services.

The operation of the starters is very simple. When starting motors it is only necessary to press a button, close a small knife or snap switch. The starter then automatically makes the proper connections to limit the starting current to a suitable value and to vary the time required for acceleration according to the load on the motor, thus preventing damage to the machinery by too slow or too rapid acceleration, and saving time by bringing the motor to full speed at the most rapid permissible rate.

As the power on any circuit may fail suddenly, it is important that some protection be afforded both operator and motor against an unforseen return of power. This protection may be provided for motors operating pumps, compressors, etc., by a low-voltage release to disconnect the motor from the line when the voltage is low or power fails entirely. Then, as soon as power returns, the motor will automatically start up again. In many applications, however, such as for motors operating machine tools or wood working machines, low voltage protection is required. Motors so protected are disconnected from the line when power comes on again until the operator presses a buttom or manipulates a similar device. Hence, there is no danger from the unexpected starting of a machine.

Mill Conditions and Market Reviews.

Southern Mill Situation.

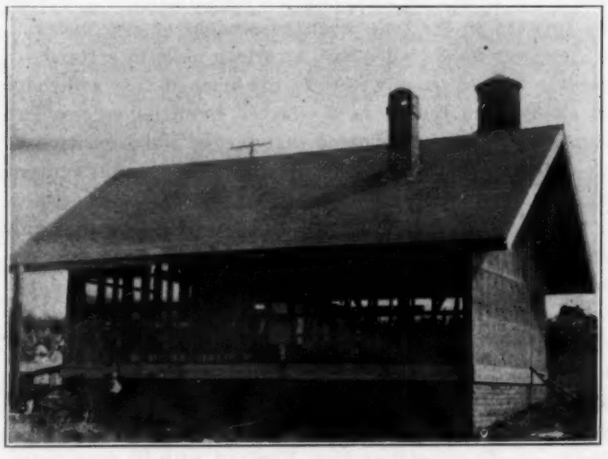
The two principal features occupying the attention of the Southern cotton manufactures as these lines are dictated, may be enumerated as follows:

First, and by far the more serious, the war excess profits tax on textile corporations as outlined in the War Revenue Bill of the Senate Finance Committee.

Second, and in this instance also serious enough to require personal representation and a desire for modification, the proposed rules for governing the enforcement of the Federal Child Labor Law.

Both of these subjects have been so thoroughly discussed at the various meetings of cotton mill men and others, that it is useless at this time to go into further details. The Senate bill will have to be passed by the Senate, and if the committee recommendations all prevail, it is to be presumed that the two bills as passed by the Senate and the House, will then go into conference of committees from both bodies. Inasmuch as the two bills are radically different, it is impossible to forecast which body will prevail in the final disposition.

The accompanying illustration shows the new cannery at the Dunean Mills, Greenville, S. C. This cannery building, which is 18 ft. x 22 ft., is covered with two thicknesses of screen wire, one ordinary fly protection wire, and the other



The Cannery at the Dunean Mill, Greenville. See the Text Matter for Description.

of heavier and coarser mesh to protect the finer wire from injury. This building is furnished with special equipment for canning the fruit and vegetables grown by the mill operatives in their gardens. The equipment is now producing from 1,000 to 1,200 cans each week. The mill management purchased a car load of cans, which they sell to the operatives at cost. The cannery is operated by the mill without charge to the operatives, the workers therein being on the mill payroll. This work is in charge of Miss Alice Mackey, who was formerly principal of the Dunean School. With the building of the new cooperative school building which will be utilized by the villagers of the Dunean Mills and the Mills Mfg. Company, the school has passed into other hands, and Miss Mackey has been retained by the Dunean Mills in charge of their welfare and health service department.

At the Judson Mills, which are located only a short distance from the Dunean plant, a new addition is being built, and when completed, the mill expects to manufacture the silk yarn used in the warps of the dress goods manufactured at this plant. These yarns are at present purchased elsewhere.

The Judson Mills have also purchased a complete canning equipment, and will, in the near future, erect a suitable building and aid their operatives in preserving the ex-

A Row of Homes in the Judson Mill Village. The Homes in This Village Have Fire Resisting Roofs.

cess production of their gardens. Small sections of these gardens are visible in the accompanying illustration which shows the neat and home-like appearance of the houses in this village, where all buildings are equipped with fire-resisting roofs.

Another improvement at the Judson Mills is the installation of a four-ton Arctic ice machine adjoining the boiler room. Sometime ago the management decided to fill up all the surface wells and furnish Paris Mountain water to the operatives, but owing to the long pipe line that was necessary, this water has been found to be particularly warm and unwholesome for drinking purposes in the summer time. Because of this the ice making equipment outlined has been installed, and ice is sold to all operatives at the actual cost of production.

The Highland City Mills and the Chinnabee Cotton Mills of Talladega, Ala., have been purchased by a syndicate of business men from West Point, Ga., which includes the following: George H. Lanier, LaFayette Lanier, W. S. Freeman, R. C. Freeman, R. B. Dixon, W. C. Lanier, E. J. Collins, and others. Under the terms of the sale this syndicate took charge on August 1st. These mills have been profitably operated for some time, and there will be no interruptions now they are taken over by the new management. While no very extensive additions are contemplated for the present, the new owners will eventually bring the physical condition of these mills up to the high standard maintained in the properties with which they are now con-

nected. The new officers have not as yet been elected, but it is stated upon good authority that W. S. Freeman will be treasurer and general manager of both mills. The present equipment of the Chinnabee Mill is 5,000 ring spindles for the manufacture of 10's to 18's cotton yarns. The Highland City Mills have 5,376 ring spindles, and also manufacture hosiery yarns in numbers from 10's to 16's.

On July 14th the Secretary of State of South Carolina, issued a commission to the Charleston Mills Co., at Charleston, S. C., with a capital stock of $75,000. The petitioners were Julius H. Weil of Charleston and Charles E. Grost, a Northern manufacturer. It is stated locally that the plant of the company will in all probability be located in a commodious building on Anson stret, where machinery aggregating in cost $100,000 will be installed. This machinery is already being shipped into Charleston, and it is hoped to have this factory in operation at an early date.

The Lavonia (Ga.) Cotton Mills is to enlarge its plant to nearly double the present capacity.

The Loray Mills at Gastonia, N. C., are to overhaul all the houses in their mill village and have them repaired and repainted. The Fiske-Carter Construction Co., of Greenville, have the contract.

The Dunean Mills of Greenville, S. C., are repainting their entire village, and the houses will be painted in a number of attractive but different shades.

The F. W. Poe Manufacturing Co., of Greenville, S. C., are building some additional operatives' cottages which are modern in every particular.

Rhyne's Cotton Mill at Lincolton, N. C., was recently sold to the Olinoka Mills of Philadelphia. This mill has approximately 12,000 spindles and has been operated on 2-ply combed yarns in numbers from 36's to 90's.

Local reports from Natchez, Miss., state that the subscriptions which are being raised for the purpose of starting up the old Natchez Cotton Mills is nearing the point of successful completion. It is stated that J. W. Sanders will superintend the plant.

New England Mill Situation.

The steady payment of regular and special extra dividends in the mills shows how prosperously they are making headway in these uncertain times. Business has been rather quiet for a month or more so far as business for commercial needs is concerned. Orders in hand will keep many mills fully employed to the end of the year so that any temporary lull in demand, unaccompanied with any further great shock indicating a radical change in the war outlook, does not cause uneasiness.

Many things show a changing character in the demand for merchandise. Narrow goods are wanted by converters in larger quantities than usual in order to assist in keeping prices on finished goods within ranges satisfactory to jobbers and retailers. More than the usual proportion of 27, 32 and 36-inch goods is called for. There is a trend away from extremes in weaves, and plain goods or simple fancies are wanted in place of many of the fancies that have been popular in recent seasons. Ginghams and special colored yarn goods have come into wide vogue and the position of mills with box looms is stronger than for many years.

The government has been placing a number of orders for special cloths with different mills and this merchandise is going direct to government distributing stations to be cut up or manufactured under government direction. Numbers of mills that have not made twills for some years are busy on contracts of this character. The demand for tickings has been very large. Recently many inquiries have come in for special cloths for aeroplane purposes but it is not yet settled whether any standard cloth will be finally accepted. A great many cloths of different constructions are being used for rubberizing and leatherizing, for government needs. Many cloths are being woven for Red Cross purposes and in many directions it is clear that cloths are wanted for war purposes that manufacturers did not conceive could be used.

Many of the New England manufacturers are paying much closer attention to the development of foreign trade, particularly with South America, the West Indies, Canada, Mexico, and countries outside of Europe generally. Their agents in New York are steadily establishing stronger export departments and the mills are taking greater pains in filling orders just as foreign buyers want them filled. Previous to the war the bulk of foreign business done by New England mills consisted of prints, bleached cottons, and some few miscellaneous lines. Today, all sorts of goods are being shipped, notably hosiery and underwear, bleached cottons, fancy cottons of many kinds, ginghams in plain and fancy weaves, cotton blankets, napped goods, etc.

In seeking to have the government conserve the cotton supply by placing a restriction on the shipments of cotton and cotton goods, the New England manufacturers are looking forward to the time when possessions of raw material in American hands will place American mills in a foremost position to turn quickly to the large business that will come on cloths when the needs of starved countries become imperative. These men contend that by far seeing control of the cotton supply in this country, domestic manufacturers will be put in a position where they can control competition in the world just as has been done by England in wool, and Japan in silk. Unfortunately, there has entered into the consideration of this scheme, a feeling of animosity between north and south, which southern manufacturers are doing their utmost to counteract. The benefits will be mutual, and because of the certainty of large after-war demands for sheetings, drills, print cloths, and other plain goods now made most largely in the south, the latter will really benefit more than New England with its very diversified lines.

At the end of July the markets were quieter than they were a month previous, yet the mills seemed much less disturbed than they were in early January when cotton was still low.

Most manufacturers expect that cotton will rule high for a long time. They were hoping for a larger crop this year but current reports are disappointing. Cotton has been bought freely to the end of the year in a number of instances where mills have government work in hand. Transportation in goods and in raw materials has been very difficult, due to war causes and this factor has led to the hastening of deliveries of goods for fall not really due for some weeks yet.

Print cloths eased a trifle in the last weeks of July ow-

ing to the resales of contracts by some New York converting houses. Mills have not been offering goods at any lower prices and as they are carrying no stocks, and have good orders ahead, they are quite willing to hold out of the market until there has been a readjustment of stocks in second hands. Bleached goods have been quiet recently but they are firmly held and are priced even higher than a month ago. Blankets and napped goods have been in very steady demand and from week to week mills advance prices for the small reorders they can take care of.

On Monday, July 23, the Amoskeag Company priced its lines of ginghams for spring. The market had been waiting for this move and it came as a surprise. All the gingham mills have found work plentiful this year and are going into the next spring season with no stocks and with many fall orders incomplete. Last year the price of AFC ginghams was 10½c; this year the line was opened at 17½c; utilities were 9½c a year ago and are placed at 16½c for the new season. The 32 inch chambray priced at 9c a year ago opened for the new season at 15½c.

The big company has brought out three new lines of goods, the Maybourne madras in 32 inch widths, priced at 16c; the Three Star dress gingham in 27 inch widths at 15½c, and the Aladdin cloth, a 27 inch romper fabric of great strength and wearing quality at 14¾ for lights, and 15¾c for darks.

Some other southern and eastern made lines had been on the market for some time but no prices were named. The Amoskeag prices will prove satisfactory and it is generally expected, in view of the well sold conditions of the mills, that this basis of price will prevail generally. The surprising feature of the opening was the new styling of nearly all the Amoskeag lines. The usual staples and semi-fancies were included in the samples, but there was added a wide variety of beautiful plaids and fancy weaves in small figured goods.

The vogue for ginghams has reached the stage where the most fashionable women are wearing them so that this new styling is going to take the place of many lines of fancy and novelty cottons that are not to be offered because of the very high prices asked for fine yarn fabrics.

The new wash goods and white goods season opened during the month and buyers began operating in a very cautious way. The new lines are made up of more than the normal proportion of plain goods. Novelties are offered in sample lines but the proportion shown is very limited, especially in the very fine yarn fabrics. This is due to the unwillingness of mills to accept much new business on very fine yarn goods at present prices, and to the apprehension that operatives will not be found to do the higher grade work demanded. To some extent, also, the lessening of the offerings of novelties and extremes in styles, is due to the feeling that the mass of people will economize because of the war and will buy more serviceable goods and lower priced goods where they can.

Contrary to all predictions, there is no dearth in colors. Mills are paying for dyes through the nose, to use the common expression in the trade, but they are getting them from various sources, and in a notably increasing way from home producers. Many new piece dyes are offered in poplin, gabardine, and twill weaves, and there is an increased showing of fine madras weaves and fine jacquard madras lines for waistings.

Throughout New England the labor shortage available for textile plants is increasing. Some large mills have as many as a thousand looms idle. They can find plenty of profitable work on yarns and this idleness is not troublesome save in the matter of disorganization. In sections where cantonments have been established, contractors have pulled mill help away rapidly, the higher wages being the inducement. The new draft for military purposes promises to diminish the working forces even more. In Fall River alone, more than 1,000 voluntary enlistments were made before the draft.

The finishing plants are running irregularly. Printing lines in the job finishing works have been quiet. The large print works, on the contrary have been kept busy, save where minor labor troubles have interfered with the output. All dyeing plants, especially those engaged on khaki dyeing for the government, are running to full capacity and will be busy for months. Some of the black dyeing plants are running in full and have work ahead for 90 days. There are some bleacheries that are very busy indeed. Those engaged on fine white goods have been rather slack but those engaged on wide sheetings, or plain goods, have found plenty to do.

News from the machinery plants is all of one character. There is more work offered than shops can take. In order to speed up government mill production, many shops have set civilian business aside temporarily and are doing everything possible to supply what is wanted. Some mills need twill motions for looms, others need heavy looms for duck weaving, and there is a miscellaneous call for machine assistance thatis being met in a fine spirit of cooperation. Necessarily, this condition precludes the acceptance of orders for new mills not engaged directly on government supplies. A great many foreign orders are being declined. When the war ceases, there is not likely to be any let up in the demand upon the textile machinery concerns in this section.

Lancashire Notes.

BY AN ENGLISH CORRESPONDENT.

The wages of the cotton operatives throughout the trade are now 20 per cent higher than they were before the war. This position has been reached as a result of the recent settlement in the manufacturing section. The operatives asked for an increase of 20 per cent and the employers declined to concede any advance whatever. Notices were put in and, on the eve of the strike, a conference of representatives of both sides was presided over by the chief industrial commissioner (Sir George Askwith.) At this meeting the employers made an offer of 10 per cent and this was subsequently accepted by the operatives' unions. Thus the weavers and allied workers were placed on a level with the spinners and cardroom operatives. It is important to note that the advances granted are advances of wages properly so called; they are not "war-bonuses," and the payment of them will not automatically cease with the ending of the war, or with any fall in the cost of living which may then take place. Any future demand by the employers for a reduction of wages will be made in the ordinary way and

because of the state of trade, not only the ground that the advances conceded during the war were for a limited period only.

A fair number of firms took advantage of the Whitsuntide holidays to close their mills for longer than the customary period. The Master Spinners' Federation took a ballot of its members as to whether there should be a general stoppage of a week's duration, but the majority of 80 per cent which was necessary for official action was not obtained. In considering this fact in relation to the state of trade, it is well not to forget that individual firms and the trade generally have an interest in not creating the appearance of there being little business doing. Firms appealing at the military service tribunals for the exemption of employees might find themselves at a disadvantage if it could be pointed out that, for such and such a period, their mills had been closed owing to lack of business. As to the trade as a whole, in these times, when there is so much arbitrary interference with industry, embracing so many hampering restrictions, it is as well not to give the Government the impression that there is "nothing doing." It is pretty generally agreed that, in the recent ballot, the master spinners displayed something of the wisdom of the serpent. Owing to the shortage of labor there are now 13 mills, containing an aggregate of half a million spindles, stopped in Bolton.

The controversy between the master spinners and the operative spinners as to whether wages shall be paid for the time during which the mules are stopped and the men are cleaning them, has been carried a stage further. Narrowed down, the point in dispute is whether, in the present wage lists, allowance is made for the wages lost by spinners during the time they spend on cleaning. The employers contend that such allowance is made and the operatives take an opposite view. Their proposal is that mules shall be stopped for from 2½ to 3¼ hours per week, according to their length, for the purpose of cleaning and that, for the time so spent, the men shall be paid at the rates to be agreed upon. At present no wages are especially allotted for this class of work. Recently, the members of the operatives' union were ballotted as to whether they would be prepared to strike, if a strike were necessary to enforce their claim, and the result showed a majority of 94 per cent for striking. With their hands thus strengthened, the union officials are pressing their case very strongly and a joint sub-committee has now been appointed to examine the wage lists and report as to how far, if at all, the time lost in cleaning was taken into consideration when they were drawn up. The example of the operative spinners has been followed by the cardroom workers, whose position in regard to cleaning is similar, and they are asking that the cardroom machinery shall be stopped at ten o'clock on Saturday morning and the remaining two hours of the working day be occupied with cleaning, for which wages shall be paid.

At the monthly meeting of the Council of the British Cotton Growing Association it was reported that, owing to the shortage of shipping, there was very little prospect of shipping cottonseed from West Africa for some time, and arrangements have been made for the association oil mill at Ibadan to be kept working to its fullest capacity during the present year. Cotton is now coming forward more rapidly from West Africa and about 5,000 bales have already been shipped. The quality of the new cotton crop is quite satisfactory. The Government Agricultural Department has been taking steps to establish a new variety of cotton in Northern Nigeria. It had been anticipated, from the quantity of seed distributed, that about 1,500 bales of this type of cotton would be produced during this season, but, owing to the unfavorable climatic conditions, the crop will not amount to more than from 300 to 400 bales. A consignment of this cotton has been received at Liverpool and realized 200 on. This cotton gives a much greater percentage of lint to seed cotton than the native type and the opinion was expressed at the meeting that, if the whole of the cotton from Nigeria was of the same quality, there was a great future before the industry. From this variety there are 148 tons of seed available for distribution for next season, which should produce at least 2,000 bales.

Mr. Worsley, the association's manager in Uganda, reported that the cotton crop generally is this year below expectations. It will not exceed 25,000 bales as against an estimate of 40,000 bales. The plants in some districts are splendidly bolled, but the rain has been abnormal and many of the bolls are falling and rotting. The past season's crop at Tokar in the Sudan was the largest on record; 57,000 feddans were planted and the crop is expected to yield 70,000 kantars. The Tokar crop, it is thought, would probably be increased by 50 per cent if steps were taken to control the floods, which it is estimated would cost £100,000. Some of the finest Egyptian cotton is produced in this district. At present cotton cannot be shipped from Nyasaland owing to the lack of shipping facilities, and it has been pointed out to the Government what a great misfortune it would be if the cotton could not be taken off the hands of the natives after they have been encouraged to grow it.

By the time these lines are read the cotton trade here will very probably be on short-time. Cotton is now nearing eighteen pence per pound and the sensational rise of the past week has led to a rapid development of the conviction that short time is urgently necessary. Meetings are to be held to consider the situation. In the third week in June there are only 445,200 bales in stock in Liverpool as compared with 666,070 at the same time last year, and it is estimated that the supply will only last seven weeks failing the general adoption of short time. In the opinion of Sir Charles Macara organized short time should be entered upon immediately.

F. M. Walker and Co., of Liverpool, have issued a pamphlet on "The Effect of Peace Upon the Cotton Market." After discussing the probability of a declaration of peace this year they draw the following conclusions: "(a) Prices are likely to advance immediately in America; (b) Liverpool will not keep pace with that advance; (c) subsequently, when the supply of cotton catches up to the demand, prices will steadily and substantially decline both in America and Liverpool; (d) the parity between Liverpool and America will at once substantially narrow."

The man who stirs up the most mud is the one who wades in shallow water.

Cotton Comment.

H. AND B. BEER.

New Orleans, July 17, 1917.

Prospects for the new crop remain unsatisfactory as a whole, for while some improvement is reported from the central and eastern portions of the cotton region as result of beneficial rains, the drouth in Texas has been broken only in north and east Texas and in sections of the central portion and in the panhandle district, the situation in southern and western Texas, as well as in districts of the central portion of the state now being serious.

The average total rainfull in Texas for June was the lightest on record, or at any rate since 1888, amounting to only .77 of an inch vs. 2.16 last year, 2.25 year before last, 1.47 in 1914 and the 10-year normal of 2.95. For seven months ending with June 30th, the total average rainfall in Texas was only 9.41 inches vs. 14.86 last year, 19.73 year before last, 22.79 in 1914 and the ten year average of 17.62.

The government report, issued July 2nd, and which brought the condition of the crop down to June 25th, made the average condition of the plant 70.3 vs. 69.5 on May 25th, 81.1 June 25th last year and the ten year average for June 25th of 80.

Returns to the governement point to an acreage in cotton this year of 34,600,000 vs. 36.052,000 last year, a decrease of 4 per cent.

On the basis of the June 25th condition and decrease in acreage the government report indicated a yield for this year of only 11.633,000 bales, linters not included. Last year's crop, exclusive of linters, was 11,450,000 bales.

For the first two weeks of this period or since the last monthly crop report was issued by the government, private advices show only a very slight improvement in the crop, for while the central and western portions of the belt improved some, Texas deteriorated owing to the drouth.

Compared with one year ago the government estimates this year's acreage by states, as follows: Virginia, 47,000 vs. 42,000; North Carolina, 1,475,000 vs. 1,490,000; South Carolina, 2,950,000 vs. 2,950,000; Georgia, 5,178000 vs. 5,450,000; Florida, 191,000 vs. 201,000; Alabama, 2,498,000 vs. 3,469,000; Mississippi, 2,814,000 vs. 3,310,000; Louisiana 1,323,000 vs. 1,260,000; Texas, 11,640,000 vs. 11,525,000; Arkansas, 2,577,000 vs. 2,630,000; Tennessee, 886,000 vs. 895,000, Missouri, 150,000 vs. 136,000; California, 66,000 vs. 55,000; Oklahoma, 2,745,000 vs. 2,614,000; all other states 15,000 vs. 25,000.

Compared with last year the decrease in acreage amounts to 1,452,000 acres, and as the outlook for the new crop remains very unsatisfactory as a whole, perhaps the poorest on record for this time of the season, the prospects for a moderately large crop of about 14,500,000 bales, which the world will likely need next season, are very discouraging.

If climatic conditions from now on become more favorable for progress of the growing crop, the market may work somewhat lower, but as stocks in Europe are very small, there will likely develop an absorbing demand on all important declines. Unless something unfavorable happens to restrict consumption next season, there is not much hope for much lower prices for cotton for the next year or two, especially if the war comes to an early ending, in which event a sensational advance may occur.

Of the world's visible supply of American cotton, which was 1,723,000 last Friday, the 13th, vs. 2,339,000 last year, there was in the United States 1,105,000 against 1,073,000 one year ago, but only 613,000 was in Europe and afloat vs. 1,266,000 last year, of which Liverpool was credited with only 269,000 vs. 701,000 last year.

[It is of interest to note here that since the foregoing letter was prepared by the Messrs. Beer, what is believed to have been the worst drouth in Texas for many years has been broken by rains in many sections. *Cotton and Cotton Oil News* has received notices from over ninety towns reporting reasonably heavy rains. Where figures were given they ran from one to three inches. Furthermore, the report of crop conditions by the American Steel & Wire Co., for the week ending July 21st indicate the general condition of the cotton crop for the whole South as "doing well."—Editor.]

The Yarn Market.

In the yarn market the operations of the cotton speculators on the exchanges continue to be a disturbing factor. The early part of the month was quiet owing to holiday stock taking in the mills. Combed yarns continued high and firm while coarse numbers of carded yarns were showing some weak spots. Carded weaving yarns were moving slowly, but the market was generally dull.

As the month wore on the market continued dull, the buying of yarns to fill government contracts providing the bulk of the movement. The general consensus of opinion seems to be that the market will remain quiet for a matter of another 30 days and then will begin to open up. The prospects for the fall and winter are believed to be good. Combed yarns continued in a strong position, and the arrival of something like 5,000,000 knitting needles from Amsterdam and Copenhagen will doubtless help out the knitting end of the situation and increase the yarn demand in many quarters.

As the month closes there are reports of sales of 25,000 to 100,000 pounds in the Philadelphia market, but as a whole the volume of business is below normal. Some difficulties are being experienced in the transportation end of the business, and it is the belief of some dealers that these transportation difficulties will finally result in stock yarns going much higher. The weaving industry continue to be light buyers, and there seems to be little to indicate a change. Coarse numbers of carded yarns on cones continue plentiful, and the buying of combed yarns has eased off somewhat. With the coming of good showers in the majority of the cotton territory the last few days saw the beginning of a decline in raw cotton prices. If the weather conditions continue to indicate a broader and a better crop condition there is little doubt that the bear operators will break the speculative prices now being maintained on the cotton exchanges. What the result of this will be in yarn prices remains to be seen.

Following are recent quotations on the Philadelphia market:

Southern Single Skeins.

4s to 8s	40 @40½	20s	41½ @42
10s	40½ @41	24s	47 @47½
12s	41 @41½	26s	48 @48½
14s	41 @41½	30s	54 @55
16s	42 @42½		

Southern Single Warps.

8s	40½	@41	20s	42½	@43
10s	41	@41½	26s	48½	@49
12s	41	@41½	30s	55	@56
14s	41	@41½	40s	61	@62
16s	42	@42½			

Carpet and Upholstery Yarns in Skeins.

8-4 slack	39	@39½	8-3-4 hard twist	38	@39
9-4 slack	39½	@40			

Southern Two-Ply Skeins.

8s	41	@41½	24s	48½	@49
10s	42	@42½	26s	49½	@50
12s	42	@42½	30s	50½	@51
14s	42½	@43	40s	61	@62
16s	43	@44	50s	82	@83
20s	43	@43½	60s	93	@95

Southern Two-Ply Warps.

8s	41½	@42	24s	49	@49½
10s	42	@42½	26s	50	@50½
12s	42½	@43	30s	51	@51½
14s	43	@43½	40s	63	@64
16s	43	@43½	50s	83	@84
20s	41½	@42½			

Northern Two-Ply Carded Peeler Skeins.

20s	46	@46½	36s	39	@40
24s	51	@52	40s	70	@71
26s	52	@53	50s	86	@87
30s	55	@56			

Two-Ply Combed Peeler Skeins.

20s	61	@62	50s	95	@96
24s	64	@65	60s	$1.05	@$1.10
30s	76	@77	70s	$1.10	@$1.15
40s	85	@86	80s	$1.35	@$1.45

Southern Frame Spun Yarn.

8s	41½	@42	22s	49	@49½
10s	42	@43	24s	50	@50½
12s	42½	@43½	26s	52	@52½
14s	44	@44½	30s	54	@55
16s	45	@45½	40s	66	@67
18s	46	@47	30s tying-in	51	@52
20s	48	@49			

Northern Mule Spun Carded Yarn on Cones.

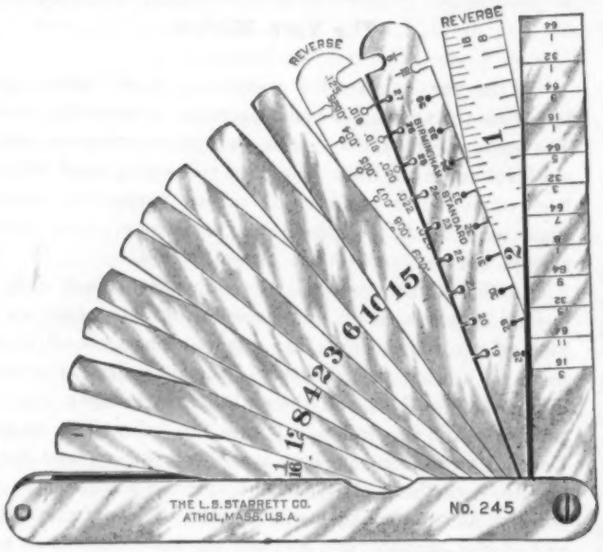
10s	45	@46	20s	50½	@51
12s	46	@46½	24s	54½	@55
14s	47	@47½	26s	55½	@56
16s	47½	@48	30s	63	@64
18s			40s	68	@70

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	59	@60	24s	68	@69
12s	60	@61	26s	69	@70
14s	61	@62	30s	75	@76
16s	63	@64	36s	80	@82
18s	64	@65	40s	85	@86
20s	65	@66			

Special Cotton Mill Gauge Free—

for a few minutes of your time.



The taper gauge shows the thickness in 64ths to 1/16ths of an inch on one side, and on the reverse side is graduated as a rule three inches of its length, reading in 8ths and 16ths of an inch.

The wire gauge, English Standard, shows on one side sizes numbered from 19 to 36, with two extra slots, one 1/16, the other ⅛ on an inch, and on the other side shows the decimal equivalents expressed in thousandths. This gage has also 9 thickness or feeler gage leaves, approximately 4 inches long, of the following thicknesses: .002, .003, .004, .006, 008, 010, .012, .015 and 1/16th of an inch all folded within the case, which is 4¾ inches long, convenient to handle or to carry in the pocket.

Our Service Department desires the opinions of active mill men on the quality of the work shown in the advertising pages of this issue of COTTON.

We are, therefore, going to give this gauge for the best letter by a mill executive who gives the clearest and most definite reasons why, and in what maner, any certain advertisement is, in his opinion, the best.

Contestants must be mill executives, from overseers to presidents, connected with spinning, weaving, knitting, or finishing plants. The letter must be accompanied by the name, address and official position of the writer in order to be eligible, and must reach this office not later than the first of the month succeeding the date of issue.

The judges will be the Editor of COTTON and the Manager of the Service Department, whose decision will be final. The name of winning contestant will be announced in COTTON'S pages.

Address Contest Department of COTTON, Atlanta, Georgia.

The Advertising Contest.

The writer of the winning letter in the June advertising contest was Harry Midgley of Fisherville, Mass. The letter follows:

The Winning Letter.

EDITOR COTTON:

I wish to try again and see if I cannot bring that gauge to Fisherville.

For the June number of COTTON, I shall take the advertisement on page 53. Here we see a picture of wooden buildings with the words "Officers' Reserve Training Camp, Ft. McPherson, Ga." What more can anybody have in an advertisement to draw attention than such a caption in these times? Anyone with American blood in these days of the censor looks twice to see what the government is doing. The big letters "Government demands" show the why of the picture with some of the work.

Everybody knows that just now the government requires speed and efficient work in their contracts. So that T. H. McKinney, Inc., draws one's attention, and by a few concise words shows that they must be and are reliable to take care of electrical equipment, having just proved themselves by doing government work.

Yours truly,

Harry Midley, Overseer of Carding,

Fisher Mfg. Co., Fisherville, Mass.

Fisherville, Mass., June 9, 1917.

EDITOR COTTON:

I was very pleasantly surprised this morning to receive your letter advising me that I had won the gauge in the contest for June. I have also received the gauge and words of mine cannot express my pleasure in having one of these useful gauges in my possession.

I cannot close without a few words in favor of COTTON as I think it is the best textile paper that I have seen. I have often expressed a wish that it was published weekly instead of monthly.

Thanking you again I am,

Yours very truly,

(Signed.) Harry Midgley.

COTTON MANUFACTURING.

Plain Facts About Drawing Frames.

BY GEORGE S. BROWN.

We all know that it requires good picker laps to make good carding possible and every carder desires to obtain as perfect a card sliver as he can, but it seems like wasted effort to use the time, brains and labor required for producing good sliver if we ruin it in later processes. From the way many drawing frames are operated and cared for, so much damage is wrought on the material passed through them that the good results procured in the previous processes are more than offset. Perfectly good card sliver can very easily be turned into uneven, lumpy, ragged or cut drawing with slugs of clearer waste scattered throughout its length.

Taking into consideration the number of spindles supplied by each delivery of drawing, it certainly behooves the carder to do his level best to keep his drawing frames in A-1 condition; and a great help to this end—in fact, the only way—is to have good tenders. Don't think that it is unnecessary to pay attention to the evenness of the work turned off by the breaker drawing frames just because there may be two more processes for the material to pass through. A thick or thin place made on the breaker drawing may be corrected to a certain extent on the following machines, but the error while lessened in weight per yard, will also be stretched over many times its original length.

For example: A piecing of card sliver that overlaps 4 inches is made on the breaker drawing where the doubling and draft are six. This short length results in 24 inches of breaker drawing 16 2/3 per cent heavy. On the intermediate, doubling and drawing six, these 24 inches will result in 144 inches of drawing 2.77 per cent heavy. When this length is passed through the finisher drawing, there will be delivered 884 inches of drawing that is .46 per cent heavy. In each case we are considering that the five ends doubled with the heavy one are of correct weight. Of course, there is the chance that the heavy drawing may be partially corrected by a length of light drawing, but the probability of the error being further aggravated by another heavy length is just as liable, if not more so.

Beginners in a carding department, especially girls, are very likely to be started on drawing frames. New hands are prone to error, and errors on drawing frames cannot be rectified; therefore it is very desirable to have good hands run the drawing frames.

The question may arise: "Where shall we start beginners?" I would answer: "Start them on the drawing frames if you wish to make drawing tenders of them, but do not trust a set of frames to the mercies of a mere greenhorn who has had but a few hours of teaching."

Furthermore, put the beginner on with a good tender who will set a good example as to how the work should be performed. Don't start a new hand on a set of frames operated by a tender who has the reputation for laziness, just to help him keep his work up. The beginner, very likely, will have *all* the tending to do and not understanding skillful manipulation will make mighty hard work of the job and mighty bad work for the next process. To make the best trained hands, start them with the better trained and more efficient ones. Tell the new hand to take orders from the old tender and then keep out of it yourself.

There are many things to look after around drawing frames:

Keep the leather covered rolls well varnished, and have a sufficient supply of extras on hand to meet emergencies. If allowed any choice in leather rolls, choose shell rolls. These do not require as much oil or as frequent oiling as solid rolls. The oil being inside the shell, stays there on account of the increased diameter at the center of the arbor on which the shell turns. Shell rolls do not show the tendency to stick that solid rolls do when starting a frame.

If the roll varnish wears away quickly, try a little more glue in it; if it shows a tendency to crack, use a little less glue. Three or four coats of varnish are better than a single heavy coat, and furthermore, a heavy coat applied to a new roll is very liable to open up the lap and thus ruin the covering. When applying varnish, do not allow it to get onto the roll necks. If it does drop on the necks, wipe it off thoroughly or the roll will stick when put into the frame. This applies of course, to solid rolls.

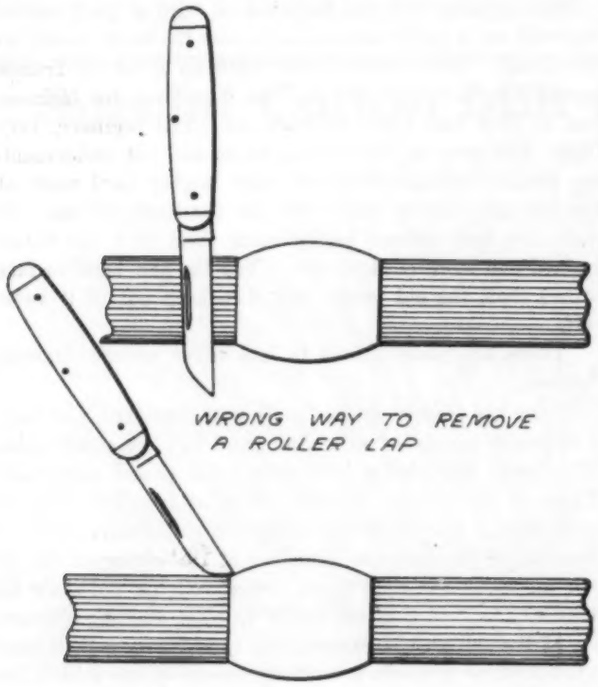
To protect leather covered rolls as much as possible from injury, be sure that the tenders remove the weight pressure on them every Saturday when shutting down. It requires but a turn of the lever on the weight relieving motion. If for any reason, the weights are taken off a drawing frame, be sure that they are put back correctly. The greatest danger lies in getting a heavy weight on one end of a roll and a light one on the other end.

Do not use a light spindle oil on drawing frame rolls or, in fact, on any rolls in the carding room. A heavy bodied oil is necessary as it will stay in place and stand the pressure, supplying an oil film of sufficient thickness to prevent undue friction which will be present if a light oil is used.

If considering putting in new drawing frames, by all means designate metallic rolls,—top and bottom. This will do away with all recovering, abolish roll varnishing, de-

crease licking, and the mill will not be compelled to carry extra rolls as is required when using the leather ones. Another advantage is a more positive draft. They must be watched very carefully for one thing: Particles of dirt, seed, etc., accumulate in the bottom of the flutes and cause the top rolls to jump and cause cut work. More frequent scouring of metallic rolls than is given to common rolls will obviate this trouble.

Keep the numbers as far as possible on the finisher drawing frames. If the work is running good and the numbers rarely jump, twice a day may be sufficient to do the sizing. Don't hesitate to size four times a day if necessary. When changing a draft gear, change every head of drawing on that weight of material. Don't change a frame



REMOVING ROLLER LAPS.

here and there, as this will sooner or later bring disaster. When all the work is heavy or all the work light, the error can be corrected at a later process; but when the frames are turning off a mixture of heavy and light work, nothing can be done for it. And I doubt if there is anything much more discouraging to fly frame tenders than to have some ends as tight as fiddle strings while others are so slack that they curl around the flyer bosses. If there is, it must be the contents of their pay envelopes received for trying to run such work.

Determine to produce a good drawing and then keep an eye on the many things that may cause trouble.

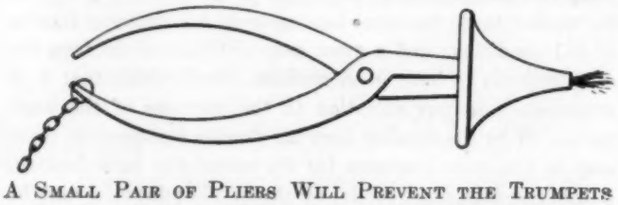
If the sliver guides at the back of the frame crowd the sliver into too narrow a space causing some of them to override others, open up the guides, if adjustable, or get new ones. Watch out for defective spools. Occasionally one of these will be out of balance and fail to rise promptly when an end runs out. Jumping top rolls mean a bent bottom roll or a roller lap. Sometimes trouble is caused by soft weak drawing. This is made by too large a hole in the trumpet or not sufficient compression by the calender rolls, and even if we discount the fact that it is a perfect nuisance by its breaking back, still, the uneven work produced by its stretching at places that do not break, make it imperative to eliminate this trouble.

Keep all stop motions in working order and do not allow cans to be filled too full. This happens frequently on the cards and the pressure brought to bear on the sliver as it is being jammed and rubbed into the over-filled can, has nothing less than an injurious effect, not to mention the racking the coiler mechanism gets. This same occurrence happens on drawing frames not equipped with full-can stop motions or if equipped, out of order.

Where cans are overfilled, the sliver rises up to such an extent when taken from the coiler that if not carefully handled it will tip over onto the floor in a tangled mass and usually gets into the waste box.

Cans should be arranged back of the drawing frames so that the ends of sliver are drawn with a minimum of friction. Ends must not be crossed. For best results, each delivery should take its back drawing from cans some of which are full and some partly full; not one delivery from cans all of which are full while the next delivery is being supplied by cans all of which are nearly empty. Six full cans are liable to make a heavier drawing than six cans nearly empty where the lifting tension is greater.

It is but a small job to wipe off a drawing frame and to pick the clearers; so perhaps this is the reason why it is so often overlooked to the deterioration of the work. It is but fair though, to give the tenders a show to properly per-



A SMALL PAIR OF PLIERS WILL PREVENT THE TRUMPETS FROM BEING RUINED BY THE TENDERS.

form their duties by supplying them with necessary brushes, brooms and receptacles for waste. Don't blame the tenders for particles of clearer waste in the drawing if you allow the clearer cloth to wear to rags and tatters before renewing it. Occosionally a roll shows a tendency to lick and a bunch of waste is stuffed back of the clearer to increase the pressure and stop the licking. The clearer will soon require renewing for even if the roll is removed it is very doubtful if the bunch of waste will be.

A pair of small pliers having a long slim nose are very handy about drawing frames for freeing plugged trumpets. Have one for each tender and fasten them to a small chain to keep them from finding their way into somebody's tool chest.

It has taken much labor and material, good machines with careful adjustments, and skilled attention to get the cotton as far as the drawing frames. Now, if a finished drawing can be turned off that is *practically* perfect and close in weight to the standard desired, we have smoothed the path not a little toward excellent spinning. Don't get discouraged if the spinner says: "My spinning is running fine but I'm always waiting for roving." If the room is turning off a good production of good roving, nothing more can be asked. The fact that the roving is good is the main

reason why the spinning is running so well and it is only natural that the spinning room should be right up with the card room. If the superintendent of the mill is "onto his job" he will understand; if he fails to, his card room overseer is too good a man to be in his employ.

Causes and Prevention of Uneven Yarns.*

BY A. C. ATKINSON†.

One very important consideration to be kept in mind in selecting cotton for mill use is to see that the samples are even running as to the length of the staple.

The first process in the mill after the bales have been opened is the mixing. This is or should be a part of the process of every mill, but in some cases its importance is under-estimated. By mixing we do not neecssarily mean the mixing of different grades or varieties of cotton, but the mixing of different bales of the same grade and variety. This is absolutely necessary to produce the best results, for even when the different bales are of the same variety, the same grade grown in the same locality and supposed to be of the same length of staple, there is likely to be found a slight difference in length, color and conditions. There is also a great difference in the amount of moisture in the different bales. Some are too dry to work well while others are too moist, and by mixing the dry cotton with the moist the dry will absorb some of the moisture from the damp bales, and a better average condition is secured. The mixing also allows the opening up or expanding of the condensed cotton, leaving it in better shape for the action of the beaters in the picking process.

The common method for mixing in this country is to provide extensive floor space back of the feeders. The larger, the better, within reasonable limits. When the bales are opened, the cotton should be taken from one or more bales, and scattered evenly over the floor, this should be repeated from other bales until a pile or stack is formed containing enough cotton for several days' run. This pile of cotton will be composed of many thin layers, each representing a bale, more or less. When this is fed to the machine it should be taken in as near vertical sections as possible so that each arm full will contain parts of each bale. In this way a very thorough mixing is secured, giving a more even and uniform condition of cotton from start to finish.

When waste is added to the mixture it will be very necessary to see that it is evenly distributed for an excessive amount of waste in one place is liable to cause annoyance in working and produce bad results. Again if the cotton being used has been compressed it is absolutely necessary that it be opened at least thirty-six to forty-eight hours before using, in order to get the best results.

Much has been said and written about the importance of the pickers, yet I question whether it is fully understood how very serious a factor in the production of good work the picker is when intelligently and conscientiously run. Keep the automatic feeder near the same fullness as possible; the hopper should not be allowed to get over three-fourths full. An even lap on this machine can come only from an even feed from the hopper.

The speed of the beaters should be regulated according to the length of staple being used. The less beating given to the cotton, the stronger and better the yarn will be; it should be beaten just enough to take out the trash.

Irregular speed of picker is the cause of uneven work a great many times. Low speed of fan and insufficient suction to hold cotton on screen will give a lap full of thick and thin places with different weights per yard, which will make variations in numbers throughout the mill.

A high speed beater will create a draft. If the beater draft is stronger than the fan draft, it will blow the cotton off the screen, causing lumps to be in the laps. This may be remedied to a certain extent provided the eveners are kept in good shape. If they are not, they cannot respond to a delicate change in the weight of the incoming feed. The result is uneven laps.

Lappers should be kept well cleaned and oiled with entire freedom of action of the working parts. Evener belts should be kept free from all greases, lint and dirt and at the proper tension. No matter what weight per yard the laps are to be, the evener belt should be made to run in the center of the cone which gives an equal adjustment for either heavy or light feed.

The lap aprons should be kept in perfect repair, for every time the evener belt or lap apron slips it will cause light places in the laps, which will make uneven laps. The writer would recommend that all aprons on pickers be pulled with sprocket chains, which insures no slipping and prolongs the apron's life. When placing full laps upon the aprons of the finisher or intermediate lapper, avoid replacing more than two at a time (much better one at a time) and let them be graduated from a small piece to a full lap. This prevents over-weighting of aprons, lessening the possibility of slipping and making thin places in the lap. A very accurate and sensitive lap weighing scale should be provided and several weighings a day made on the intermediate lapper in order to keep to standard weight.

Every lap coming from the finisher should be weighed, and only a very slight variation should be allowed.

The pickers should be set to clean the cotton well, and make good laps that will not split in the carding.

To get good, strong, even yarn a mill should have cards enough to do light carding. Cards should be ground often enough to keep them sharp at all times. Never wait until the cards become dull before grinding, as any amount of bad work may be done. Good, even sliver from the cards depends upon grinding and accurate settings.

The setting of the cards depends on the length of staple, and quality of cotton being used. There should be a system of stripping the cards. Never allow the cylinder and doffer of cards to get too full, otherwise the card will comb the trash into the good sliver. It is best to strip each alternate card in a line. Do not put the end up too quickly after stripping, but allow the sliver time to regain its normal weight before going into the can. Cards not stripping the same in flats or cylinder or both or not making the same amount of flyings, will cause variations in slivers. Card tenders in putting on new laps should be taught to place them in very evenly. Cards should be kept clean all the time in order to prevent batches of fly from collecting and blowing or dropping into the web. Do not allow the can to run too full and tight, as this tends to stretch and weaken the sliver.

*Extracts from an address before the Southern Textile Association.

†Superintendent Liberty Cotton Mills, Clayton, N. C.

The drawing frames are the most simple machines used in the carding department; this is why the importance of these machines is many times overlooked. The writer considers this machine one among the most important in the making of good even yarn, and it should be looked after very carefully. Very often when the carder has new help to work and they are not skilled enough to put on other work, he puts them on drawings. This is a great mistake. There should be a competent and painstaking person in charge.

An improper working stop motion would let an end run through, then, if you haven't a good man on the job he puts up the end, but fails to pull out the single drawing that has passed. It may not be many yards, but by the time it has reached the spinning room it has increased many times this length and the result is weak and uneven yarn. A very important part of the drawing frame is the top rollers, whether metallic or leather covered. They should be kept in good condition and properly oiled. If metallic rollers are used they should be thoroughly cleaned once a week and all dirt and foreign substance removed from the flutes. If this is not done the flutes become full of dirt, and the rollers will be slightly raised, thereby causing cut sliver.

When leather covered rollers are used they should be varnished often enough to keep them in good condition and with varnish that will not crack and peel off. When they are taken out to be varnished each roller should be examined and all worn out and loose covers should be removed; also see that the weight is uniform on all rolls. Rollers should be spaced to suit the stock being used. This applies to the length and condition of staple.

Worn out trumpets are a defect on drawing frames and by all means see that the motions are kept in the best of order to prevent singling. The drawing sliver should be weighed at least four times per day and changed according to conditions, as the drawing frame is the place to keep the yarn even. If the drawing is even there should be very little changing to do in other processes.

In the slubbing process there is no doubling and it is the first machine to put twist into the stock and wind it upon bobbins. Run just enough twist on the slubber to prevent stretching and breaking back in the creel at the next process. Such machines as slubbers, intermediates, speeders, jack and spinning frames should be overhauled, lined and leveled at least once each year.

Flyer frames must receive proper attention if even roving is to be made. It is possible for picking, carding and drawing to be almost perfect, and then bad, uneven roving to be made on the fly frames. In each machine there is a process of doubling. This adds to the evenness of the roving if the frame is in good condition. Top rollers should be kept clean and well oiled, if not they will run dry, thus causing cut and uneven work. Keep all worn spindles and bolsters out of the frames, have steps oiled every two weeks, keep all bad bobbins off the spindles as bad bobbins will vibrate or shake and make the roving uneven. Steel rollers should be kept clean, free from laps, oiled and stand in good shape. All crooked joints renecked and made to run true, gears set so as not to bind or cause the roller to vibrate as uneven work will result. The rollers should be set to produce an even strand. One should be governed by the twist of roving, weight of stock fed to roll, and the length of the staple being used. Creels and roller beams should be wiped off and not fanned off, as the latter causes bunches to catch in with the work. Roving must not be laid too close on the bobbins as the layers will ride each other, stretching the roving too far apart, but should be laid so as to give a smooth appearance. Another defect on roving frames is the bobbin gears jumping here and there which is caused by the gears being very dirty or not properly set.

When bobbin gears are allowed to jump it causes the coils to override each other, as they are wound on the bobbins and when bobbins are being unwound at the next process the part of the coil that is receiving the pull may be under another coil which will either be broken or stretched, making uneven work. Ends being wound around the presser a different number of times, or allowing the eye or hollow leg of flyer to become clogged with dirt will cause hard or soft bobbins to be made. Do not let the frame tenders run frames too full as this will chafe and cut the roving. Roving frame tenders should not be allowed to take up or let off the tension, for great care must be taken in regulating the tension upon roving. If ends be too tight the roving will be uneven and full of thin places. If too slack it will be wound on the bobbins too loose, making soft bobbins which will stretch or break back in the creel at the next process, making uneven work. Roving frame tenders in creeling should not be allowed to lap their ends, but join the ends together, thus saving a thick place in the roving. Frame tenders should not be allowed to make singling and doubling, for every singling and doubling made on fly frames means bad running, spinning and weak and heavy yarn. Clearers should be picked regularly. A tender should not be allowed to stick cotton under clearer cloths in order to tighten slack ends, as this will damage the roving. With the best of roving delivered to the spinning room, if not under good watchful management, uneven yarn will be made.

Draft is a very important item, as excessive draft will cause uneven yarn and bad running spinning. The draft should not exceed twelve, and ten-fifty to eleven is much better for double roving. As I have said elsewhere the rollers must be properly set to the length of the staple, which is about one-eighth of an inch greater from center to center of front and middle rollers than the length of staple. If the rollers are too close together the front roller will be biting the end of the staple before the middle roller turns it loose, thus causing cockley and uneven yarn. Avoid changing draft gears on spinning as much as possible, because nine times out of ten you will make a thin place in each end on the entire frame. I find from various tests that standard twist is the best, as too much twist tends to weaken the yarn and destroy the elasticity.

Frames should not run at an excessive speed and produce waste and not yarn, as this makes trouble for everybody concerned and causes discontented help. Every end that is put up makes a thick place in the yarn. Frames should be overhauled once each year, lined and leveled. Spindles plumbed at top and bottom and guide wires set to the top. Keep all bad spindles and bolsters out of the frames.

Guide wires that have grooves worn in them should not be used. Roving creels on all machines from intermediate to spinning should be in line and perfectly level. See that roving sticks are in good shape and not allowed to become

nubby on the points, as this will stretch the roving and cause lots of uneven yarn. Have roving creels wiped each day, for if lint and cotton are allowed to collect around the ends of the roving stick it will be hard to pull, and the roving will be stretched.

Banding is a very important item and we can not give this too much attention. Bands should be made of roving and uniform in size and twist and weigh about one pound to 120 bands and have them tied on as near the same tension as possible. It is a well known fact that a slack band will make soft yarn which is waste and will cause bad running spinning and uneven yarn. Oiling is a factor in this department and attention should be given to the top rollers which should be oiled at least three times a week. Spindles should be oiled every two weeks, as a dry spindle will vibrate and make uneven yarn. See that the oiling throughout the mill is properly done and that none of the steel rollers are allowed to wear in the stands as this will cause them to vibrate and make uneven yarn.

Travelers play an important part in good running spinning, and we should give them close attention. On coarse yarns the travelers should be changed before they become worn enough to chafe and cut the yarn. On fine yarn they need not be changed as they will fly off after running a while.

Keep the weight levers in line so that none of them will rest on the creel board, and thereby get uniform weight on the top rollers so as to save bad running and uneven work. See that the roving traverse has a good stroke, let it run as near the end as possible without running out. It should not dwell upon the chains for if the roving remains too long upon one spot it will wear a groove into the cot of the top roller. And when the roving gets into the groove the rollers will not draw it as they should, thus causing lumps and bad places in the yarn. Keep the scavenger rollers in good order and turning at all times so as to catch the sliver as soon as the thread breaks. If the sliver is allowed to collect on the thread boards it will fall off and catch into the other ends, breaking more down or causing lumps and gouts on the ends next to it.

Do not allow the roving to wind around the steel rollers and stay there, as this will raise the top leather roller and make the yarn uneven. Keep all lumps of cotton out of trumpets as this will make the roving draw hard and make the yarn weak. Keep all worn rings off the frames, for good even yarn cannot be spun on a bad ring. Do not allow spinners to let three strands of roving run into one end where two is all that is necessary. Have the separators set exactly in the center between the rings. The travelers should be of the correct weight in order to give the proper tension to prevent the yarn from whipping against the separators, as this will chafe and injure the yarn.

Another very important factor in the making of good even yarn and good running work is that overseers of the different departments should work in perfect harmony with each other. Nothing but friendly relations should exist. They should consult together, give and take advice, and good will result.

We have noticed that many men who have lofty aims are poor shots.

The Revolt Against "Efficiency."

BY G. D. CRAIN, JR.

Few manufacturers have failed to feel strongly that the action of Congress in passing the Tavener anti-efficiency bill was wrong, and this sentiment is based not necessarily on hearty support of all the ideas of modern efficiency engineers, but on a realization that a decision on the merits of the question was not undertaken, but that the action, as *The Saturday Evening Post* pointed out, was merely an indication that political pressure had been brought to bear. Business men don't like to see business questions decided in that way, in Congress or elsewhere.

So, while the Tavenner measure is certainly not an indication of the sentiments of even a small majority of manufacturers—nor, in the opinion of the writer, a real index of the feelings of labor on the subject of efficiency—it is at least a sign of the times. It gives a text, as it were, on which to preach about efficiency, with reference to the possibility that it may have been overdone in some respects. The Tavenner anti-efficiency measure is one extreme; but isn't it likely that the extreme representing the swing of the pendulum in the other direction is equally undesirable?

The writer was recently in a big cotton mill, and noted that the operatives in the spinning room had seats, and were using them rather frequently. Remark on the subject of conditions of labor in such mills, where employees are certainly not driven at the rate seen in many other industries where women are employed, brought some interesting comments from the superintendent.

"The labor inspector in this territory," said he, "suggested having seats some time ago, and the president of the company took it up with me, expressing himself as being favorable to the idea. I pointed out to him, however, that as conditions were, the hands had been given as many spindles to tend as they could possibly look after, and that it would be next to impossible for them to use the seats to any advantage.

"'It might look all right to put in the stools,' I said, 'but as far as their practical usefulness is concerned they wouldn't be worth while.'

"We got to thinking this over, however, and considered whether common sense, getting away from 'efficiency' for the time being, didn't suggest giving the operatives work enough to keep them reasonably busy, but not so much that they never had a chance to sit down. In fact, carrying the idea a little further, we realized that if the hands were pushed so hard that they had no leisure, the chances were that the equipment was not being made to produce to the maximum, because she couldn't get around to all of the spindles in time.

"The result of this discussion was that we cut down the number of spindles each hand was to tend, and got seats so that they could rest at intervals. This not only works out well by making conditions easier for the hands, but it means that all of the machinery is coming close to turning out a maximum of goods. And there is just as much real efficiency in getting the maximum out of the equipment as there is in getting the most work possible out of the hand."

Another interesting side-light on this experiment, which

showed that the mill had the right plan in making a change which at first glance was reducing the "efficiency" of the help, was that it was not found necessary to increase the rate at which the employees were being paid. They were able to keep the poundage up, with a smaller number of spindles per operative, because they could tend all of them without difficulty. Thus the mill, which had comtemplated the necessity of having to increase the rate at which piece-workers in this department were employed, had a visual demonstration of the fact that efficiency does not always consist in driving the help as hard as possible, but that the best results may be obtained by the use of what may seem to be an easy-going system of operation.

In fact, if one not acquainted with the peculiar conditions of the industry, were to go into a cotton mill and see hands chatting with each other, sitting down, or even taking enough time to go to the lunch-room for a between-meals repast, he would probably get the idea that a rather slovenly system of operation was in effect. Yet, as a matter of fact, results in terms of production and cost per pound might be entirely satisfactory to the owners of the plant. All of this is merely by way of suggesting that it is results rather than any appearance of feverish activity, without leisure periods, that should be considered first.

It may interest cotton manufacturers, who are in a position to give their hands intervals for rest purposes without interfering with production, to know that this subject is being given a lot of attention in other industries, where breaks in the work may be established only at the cost of obviously decreased output. Euthusiasts who have investigated the plan assert that the improved work which can be done by the employee who has enjoyed a period of rest, with a relief from the strain of operating machinery, more than makes up for the loss which is assumed initially.

The plan has even been adopted by extending the hours of labor, so as to get the regular amount of productive time, while giving the rest periods. It is concluded that this plan benefits the worker, who is said to be in better condition at the end of the longer day than when the work has been done without a break except for the lunch-hour. Fatigue is removed, and this fact is emphasized as important from the standpoint of accident prevention. Some of the advantages of rest periods, especially in those industries where the conditions of work require steady operation of the machines, unless a special interval is provided, are put forward by investigators as follows:

Complete relaxation, relieving mental and physical strain.

Freedom from restraint; no fear of being called to account for speaking to other employees.

Social contact with fellow-workers.

Reduced danger of accidents.

Increased production.

Improved quality.

Improved health and happiness of employees.

While some of these advantages are obviously put forward by an ardent proponent of the system, enough has been said fully to justify the plan of operating a cotton mill so as to increase the opportunity of the employees for rest periods, rather than to calculate the time required for each task so accurately that every moment will be taken up. The latter plan, if it is representative of the efficiency school of which so much has been heard, fails to take into account the human factor, which certainly cannot be treated as an inanimate piece of machinery.

There are other classes of work in every cotton mill where rapidity of operation is not desirable. Beaming, for instance, is a kind of work which might be hurried, yet without improving results from any standpoint. A mill superintendent watched work in this department of his plant recently, and remarked to a companion, "This looks like a pretty slow proposition, but this department gives us less trouble than any other, just because the work is well done. If we tried to increase the rate of production here, we'd probably find that we had spoiled a good situation."

Those who have read this article, remembering that not a few mills believe in the stop-watch plan, but have made extensive use of this idea for the purpose of bringing about better systems of operation, may find it hard to reconcile the two ideas. Yet, as a matter of fact, there is no real inconsistency involved. The point is not so much to keep away from the machinery of efficiency, as usually understood, as to bear in mind the human element as well as the other factors involved in the production equation.

In figuring rates for piece-work, which has been shown to be a good plan for both manufacturer and operative, in many classes of mill work, the only fair plan is to analyze production by means of a stop-watch, and determine a fair rate of pay, based on the data thus secured. And it should be remembered, also, that the stop-watch may be used not only for developing delinquencies on the part of employees, but also weak spots in the general scheme of management, such as the movement of material from one part of the mill to the other. The stop-watch may be the symbol of efficiency, and yet it is merely the means by which the manufacturer finds out what he wants to know about the production processes in his mill. It is the use to which these facts are put, that shows whether or not his grasp of efficiency is limited to the superficial features, or extends to include all of the elements which must be considered in working out any general plan of management.

The steamer "Hardy" left the harbor of Treport on the north coast of France in stormy weather with a quantity of soda water and of metallic sodium to the amount of two tons. The ship began to list, and men went below to see if the cargo could be secured when one of the cases of sodium burst into flames and two score of cases of soda water had already been smashed. An alarm of fire was raised and the order of fire stations was given, but as soon as the water struck the burning case of sodium there were several explosions as package after package within the case blew up. Two more cases broke open and blazed under the stream of the hose. Two additional cases flew into the air, struck the overhead beams and spread fire in all directions. The panic-stricken crew fled above decks but the captain ordered them below. Shortly after an explosion sank the ship. Sodium like potassium burns in contact with water and the consignment should have been soldered in tins and enclosed in strong boxes. The owners of the soda water sued the shipowners for the loss of these goods, and the King's Bench gave a verdict for the plaintiffs, but the consignees of the sodium did not enter a claim.—*Indian Textile Journal.*

Dyeing, Bleaching and Finishing.

Advantages of Using Soft Water in the Finishing Industry.

BY WILLIAM B. NANSON, F. C. S.

Water, being the well nigh universal solvent, may acquire qualities most undesirable to its use in the finishing industry for bleaching or dyeing, or both, as well as for its use in boilers. Water cannot occur pure in nature, on account of this solvent property; even rain, which is the purest kind of natural water, always contains carbonate and nitrate of ammonia. Spring water, artesian water or brook water may take up so many various substances that it is almost useless where boiler water is needed, or where soaps are used. The particular and special use of the water is the first, and in fact, perhaps, the only question. Is it for bleaching, or for dyeing or for the boilers?

For industrial uses chemically pure water is not only unnecessary, but positively harmful. Chemically pure water, for instance, is inapplicable in the dyeing of alizarine, where water containing lime is necessary. Then again, "saddened colors," i. e., colors raised with iron salts, will give the best results if dyed in water containing carbonic acid, lime, silica, iron, sulphuric acid, and muriatic acid, the whole solid contents not to exceed one grain in a fluid ounce. These ingredients will most probably exist in the water as sulphate of lime, muriate of lime and carbonate of iron. The iron should be in the smallest proportion; the carbonic acid and the lime in the greatest. If experiments be carried out in pure water, i. e., distilled water, it will be found on repeating them with common spring water, that one-half the quantity of dyestuffs will give the same depth of color; and that the colors in this latter instance, have more of a purple hue and are more permanent. This may be illustrated by the following simple experiment:

Take two glass jars of equal size, and fill them half full of distilled water, and add to each an equal quantity of a solution of tannic acid or sumac; put into each an equal number of drops of a solution of copperas. It will be noted that the change of color is scarcely perceptible. But if we now fill one of the jars with spring water, it almost instantly becomes a dark reddish black. Allow both jars to stand for an hour and the solution with the distilled water will have become a deep violet, while the other, notwithstanding the double quantity of water, will have become so dark that no light is transmitted; and it will require one-half more water to reduce it to the same shade as the other; but still retaining more of the reddish hue—which, by the way, makes it more suitable for black. It will also be found to be more insoluble, and requiring a greater proportion of acid to decompose it. It will be understood by the reader that in the above experiment it was the lime and other salts in the spring water which combined with the acid in the copperas to set the iron free to combine more rapidly with the tannin of the sumac to form tannate of iron or iron black.

Such experiments are especially interesting in these times when the natural dyestuffs, depending for their coloring power, as they do, almost wholly upon the various tannins they contain, are being so universally used, and it can be readily seen that a dyer learning his trade at a dyeworks where one particular kind of water was used would be all at sea when he moved away and attempted to dye a black, for instance, with the same quantity of dyestuff he had been formerly using but an entirely different quality of water. In this dilemma he keeps adding dyestuff and extra runs to get results, but colors bolstered up with dyestuffs are always dull and ineffective. We may deduce from this that a dyer ought never to expect that recipes obtained from other sections or countries would produce just exactly the same results with him as they have with others. And also that for a dyer to become eminent at his business, he must stay in one place, he must continue to practice in one situation, and with one kind of water and by these means alone, can he be expected to obtain perfection in his art, and we would respectfully suggest that those superintendents who rejoice in changing dyers (and other foremen) so often would make a note of this—"when found make a note of"—as our illustrious friend Captain Cuttle would have said.

Dyeing being an art wholly dependent upon chemistry for its development and successful practice, he who practices it without studying chemistry, is like a boy learning to repeat a thesis from some author without knowing his letters. When he knows the principles of chemistry, so far as they are applicable to his trade, he would, on finding that the same quantity of dyestuff did not yield the same results, examine the water he was using to try and discover where the difference lay, and he might find that instead of using more sumac, copperas, or logwood as the case might be to bring up his color, a little chalk or hydrous gypsum added to the water, would so qualify it as to render it equally effective with that to which he had been accustomed.

A dyer's daily experience teaches him that the water he uses has a decided effect upon many of his dyes and that certain kinds of water are better for some of his colors than others, which manifests a difference either in the condition or the constitution of the water. This difference in water experienced by dyers, depends always upon foreign matters dissolved in it. It would therefore be a great object for a dyer to obtain pure water; or, if this is not practicable, to know just what the ingredients are that are in the water that he is using, so that he may either counteract their effects and escape their consequences, or render them subservient to his purpose by adding the needed ingredients either to the pure or the impure water.

The great practical importance of water to the dyer is not only its neutrality, but also its solvent power. The cohesion of solid bodies is overcome, and the particles are diffused through those of the water, and so placed in the best possible condition for combining with the particles of other bodies brought into proximity with them.

The nature of impurities found in water depend upon its immediate source—the nature of the soil or strata of

earth through which it has passed; and as these substances act and react upon the dyestuffs used it therefore becomes of the first importance that the dyer should fully comprehend that character and effects of the substance dissolved in the water he is using. These ingredients are generally lime, magnesia, alumina, potash, soda, iron, copper, sulphuric acid, hydrochloric acid, and carbonic acid. There are also other substances, which have been found in springs in more minute quantities, but which we would not enumerate here, as they are not common; and even some of these given, such as copper, are not often present in waters used in the dyehouse. These earthy substances are generally found in the water in combination as sulphates, chlorides, or carbonates. There are also gases present in waters, as atmospheric air, carbonic acid, sulphurous acid, etc. The last named is easily detected by its smell, and water could not be used containing any appreciable quantity of it. Iron as a sulphate or chloride is often present in a very minute quantity, but when the quantity is considerable, the water is not good for many purposes.

Two common definitions of the quality of water are "hard" and "soft," but these expressions, so far as the dyer is concerned, are somewhat ambiguous, and are only useful when alkalies and soaps are to be used. Distilled water is soft and pure, and useful for all purposes of the arts, but a water may be soft and useful so far as bleaching and washing are concerned and, as we have already shown, very disadvantageous in dyeing, and it may on the other hand be hard and yet good for dyeing most colors. Such a term, therefore, does not denote any particular kind of impurities.

If a piece of pure white soap be dissolved in alcohol, not so strong as to form a jelly, and a little of the solution be dropped into water, if the soap curdles the water is hard, if not, it is soft. If hard, the ingredients are of an acid or earthy character, such as carbonic acid, carbonate of lime or iron, sulphate of lime, etc.; if soft, it may contain alkalies. The ingredients of the water are often so minute, that the ordinary tests do not for some time detect them. The best mode of proceeding is to apply the soap test first, as a sort of guide; next, to try the water with delicately prepared test papers, and observe whether it has an acid or an alkaline reaction; then take a gallon of the water and boil it down to a pint, put this into a narrow jar and allow it to settle for a few hours; pour off the clear liquid into another vessel, and retain for examination the turbid remainder, if any; it will most probably consist of carbonate and sulphate of lime with a little iron. Carbonate of lime has been held in solution as a bicarbonate; but the boiling decomposes this compound, one proportion of carbonic acid being driven off, and the insoluble carbonate is precipitated. The sulphate of lime is soluble only in small quantity, so that a little may be precipitated by the boiling. To the residue add a few drops of hydrochloric acid, and the carbonate of lime and iron will dissolve with effervescence, while the sulphate will remain undissolved. A drop or two of gallic acid added to the acid solution will detect the iron by giving a blue or black coloring. A portion of this solution in turn may be taken, and a little ammonia added to neutralize the acid; iron will give a brown precipitate with this; if lime is present the addition of a little oxalate of ammonia will give a white precipitate.

The clear portion is now divided into five different portions, and put into small wine or test glasses. To one portion is added a few drops of gallic acid, which if iron is present, will, after standing some time, produce a bluish color. To another portion add a few drops of oxalate of ammonia, which will, if heated a little, give a white precipitate if lime is present. To a third portion add a few drops of a phosphate of soda solution, and stir it well. After standing some time, if a white precipitate be formed, this will indicate the presence of magnesia. To a fourth portion add chloride of barium; if a white precipitate is obtained, which is not redissolved by adding a little pure nitric acid, sulphuric acid is present. To a fifth portion add nitrate of silver, if a white precipitate is formed, which is not redissolved by the addition of a little pure nitric acid, then hydrochlocic acid is present. These tests must be carefully made, and the nitric acid used must be perfectly pure, or no dependence can be placed upon the results.

If carbonic acid exists in the water, which it does very frequently in combination with a base, it will be known, as already intimated, by the effervescence caused by the addition of an acid; but it may exist free; and the best way to detect it, is to take a separate quantity of the water, without boiling, say a pint, and add to it a little clear lime water; if milkiness appears after standing some time, carbonic acid is present, either free or as a bicarbonate of lime. If blue litmus paper be reddened, there is often free acid present in the water.

This method of procedure, which is very simple, is sufficient to give the dyer an idea of the impurities he has to contend with. Of course the effects of each of these separately, or together, upon his dye drugs will also have to be studied. Should more correct investigation be required, such as the exact quantity of each ingredient, this must be done by a regular course of analyses, which we are afraid few practical dyers have the apparatus or other means of working. However, with the tests referred to, a near approximation may be arrived at, by boiling the gallon of water to dryness and carefully weighing the residue, which will give the whole solid matters in the gallon; and afterwards, by dissolving this in distilled water, pouring off the solution, and drying the insoluble portion, the quantity of soluble salts, which may be those of potash, soda, magnesia, etc., will be found. The water is tested for these and all other ingredients by the tests given. To the remaining insoluble part, a few drops of hydrochloric acid are added, and notice is taken if this produces effervescence. This acid solution is then diluted with distilled water, and tested as above; if anything remains insoluble it is again dried and weighed, and the result will indicate the silica present.

Water for bleacheries, dyehouses, and print works should be clear and colorless and ought to be free from magnesia, iron and lime salts. This is not merely to avoid the precipitation of insoluble soaps, but also to be sure that the colors are of full brilliancy. This is particularly evident in the instance of the benzadin and alarizarin colors. The former lose in the necessarily alkaline bath if lime salts are found, and the latter in the tone of color if iron salts are in the water; in washing and fulling woolens, a hard water will precipitate an insoluble soap on the fiber. Stains and irregular dyeing are most frequently brought about in this way. Soaps precipitated with lime or magne-

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sium are not removable in any known way, and much annoyance and loss is occasioned. The lime and magnesia soaps are insoluble and stick to the goods with unconquerable persistence. The dye cannot by any possibility go on evenly, and will be apt to rub off and crock to a humiliating degree.

COSTLINESS OF HARD WATER IN THE BLEACHERY.

A pound of carbonate of lime or magnesia precipitates ten pounds of soap. Therefore, the evil of hard water is somewhat calculable.

The hardness of water is either "temporary," i. e., due to calcium or magnesium carbonate, or "permanent," i. e., chiefly due to calcium or magnesium sulphates and chlorides.

Temporary hardness is caused by the presence of the carbonates of lime or magnesia. Although pure water is unable to dissolve these bodies, yet when it contains carbon dioxide in solution, the insoluble carbonates are converted into the soluble bicarbonates. These soluble bicarbonates are readily decomposed when heated, reforming the normal carbonate and giving off carbon dioxide. If the heating be continued until the latter be expelled, the water is no longer able to hold the carbonates in solution, and hence a precipitate is formed, the water at the same time becoming soft. From this property of being removed by boiling, hardness due to carbonates is termed "temporary." Hardness due chiefly to the presence of sulphates and chlorides of calcium (lime) and magnesium, which compounds are themselves soluble in water and which solubility is not affected by the expulsion of the carbon disulphide. Boiling does not affect the hardness due to these salts, and hence this hardness is termed "permanent."

With the exception of rain water, all natural waters are hard, the degree of hardness is generally expressed in terms of calcium carbonate per 100,000 parts, whether it is due to calcium or magnesium. Such a method of expression gives one a general idea of the quality of the water; but for bleaching purposes it is extremely important that the actual quantities of calcium and magnesium present should be known, since from every point of view, hardness due to magnesium is more objectionable than that due to calcium. The waters used for bleaching frequently contain from 10 to 50 parts of hardness per 100,000 and those approaching the upper limit are the cause of much trouble and expense and the objection to hard waters may be summarized as follows—They are unsuitable for boilers. They form insoluble compounds with certain constituents of the cotton and this prevent their complete removal. They cause great waste of soap and the precipitation of insoluble soaps in the fibers, which are very difficult to remove.

Wanklyn's Method for Determining the Hardness of Water. In this method the calcium and magnesium salts present in the water are precipitated by means of a soap solution. The degrees of hardness of water according to Wanklyn are equal to the grains of calcium carbonate per gallon, plus one.

The standard soap solution is made by dissolving 10 grams of pure white castile soap in 600 c.c. of 90 per cent alcohol and made up to 1000 c.c. with distilled water. To standardize the soap solution:—1.11 grams of pure anhydrous calcium chloride is dissolved in 1000 c.c. of water, or 1 gram of pure calcium carbonate is dissolved in an excess of hydrochloric acid. This solution is evaporated to dry-

ness; the residue is dissolved in water, evaporated to dryness and dissolved in 1000 c.c. of distilled water. Ten c.c. of this solution are transferred to a stoppered bottle of about 250 c.c.. capacity. The soap solution is then added from a burette, 1 c.c. at a time and the bottle well shaken after each addition. When the lather becomes somewhat more permanent, smaller quantities of soap solution are added each time. This is continued until the lather remains permanent for five minutes, whilst the bottle is laid upon its side.

Exactly 11 c.c. of the soap solution should be required to produce the permanent lather. If the soap solution is found to be too strong it should be diluted with equal volumes of alcohol and water to the correct strength.

To ascertain the total hardness of a water 70 c.c. of it are titrated with the soap solution as above. The number of c.c. minus one, equals the grains of carbonate of calcium per gallon, because 1 c.c. of the soap solution is required to give a permanent lather with 70 c.c. of distilled water. If the water requires more than 16 c.c. of the soap solution, or if a large quantity of magnesia is present and it requires more than 7 c.c., a smaller quantity of water should be taken and the difference made up to 70 c.c. with distilled water. This process gives us the total hardness of the water.

To determine the permanent hardness we boil 500 c.c. of the water for 30 minutes, in order to precipitate the salts which cause the temporary hardness, and fill up to the mark with recently boiled distilled water. The water is then filtered and 70 c.c. are titrated with the soap solution as described. The difference between the permanent hardness and the total hardness gives the temporary hardness.

One English degree of hardness represents one grain of carbonate of lime or its equivalent to each gallon of water.

HARD WATER IN BLEACHING KNIT GOODS.

From the knit goods bleachers, as well as the raw stock and piece goods bleacher's point of view, the objection to the use of hard water is very great, both on account of the fact that it is a much poorer solvent than soft water and also because, by setting up secondary reactions with other chemical bodies which are used, it makes the production of a satisfactory result often difficult or impossible. For instance, if hard water be used in a soda lye boil, it will, in the presence of sodium hydrate, form lime and magnesia. These will in their turn fix their equivalent of fatty acids as insoluble soaps in the fabrics, and the latter can only be removed by decomposition with acid.

The following may serve as an illustration:—Two equal quantities of cotton were boiled with a caustic soda lye, the liquor being made in one case with distilled water, and in the other with water containing 40 parts of hardness per 100,000 (30.74° hardness English). At the end of four hours the fat removed was estimated. The result showed that in the first case 23 per cent more of the total fat had been removed.

The use of rosin and other soaps in the soda boil is deemed an essential part of the process by some bleachers. With hard water it is almost impossible to remove these soaps.

Then, again, the nitrogenous or protoplasmic constituents of the cotton itself appear to be changed by boiling with hard water into less soluble compounds, which are then more difficult to remove by the soda boil, and which, if left in the fiber, will afterward absorb chlorine in the bleach and cause trouble. As we have said, hard water also causes a great waste of soap. When a solution of soap is added to pure water, the solution remains quite clear, and only a little is required to produce a lather on shaking. If, however, the same soap be added to a hard water, a turbidity is immediately evident, owing to the decomposition of the soap by the lime and magnesia and the production of the corresponding calcium and magnesium soaps, which are insoluble in water and therefore incapable of producing a lather. When this point has been reached, and not before, a few more drops will cause a lather to appear on shaking.

To possess cleansing properties, soap must be in solution and must lather. The calcium and magnesium soaps are insoluble in water and also reduce the lathering powers of a soap solution, so that the use of hard water with soap not only causes direct, but also indirect waste. For one gallon of pure water about 10 grains of soap are necessary to produce a lather, and for each degree of hardness added to this it will be necessary to add at least another six grains of pure soap to produce a lather, while with the usual commercial soaps the quantity required would be nearer 10 grains.

A water of 35° hardness will require 350 grains of soap per gallon, or one pound for 20 gallons. Magnesium hardness differs a little from that due to calcium (lime) in that it is more slowly decomposed by soap, and hence is more dangerous. Some bleachers and dyers use old "suds" to neutralize hardness, this does not affect the waste, neither does the addition of soda lessen the danger due to the decomposition of lime or magnesia soaps since they are not readily decomposed by aqueous alkalis. These calcium and magnesium soaps though white when freshly precipitated, when dried develop a brownish yellow color, the depth of color depending upon the oil from which they are made. The magnesium soaps being darker than the calcium. If, therefore, these soaps become fixed upon the fibers of the cotton by hard water either in boiling or washing, although the goods may appear to have a good color, when newly finished, they will lose their brightness on keeping and develop a yellowish brown tinge. This is more likely to occur when the hardness of the water is due to magnesium, both on account of the more marked color of the magnesium soaps and also the comparative slowness with which magnesium hardness is decomposed by soaps.

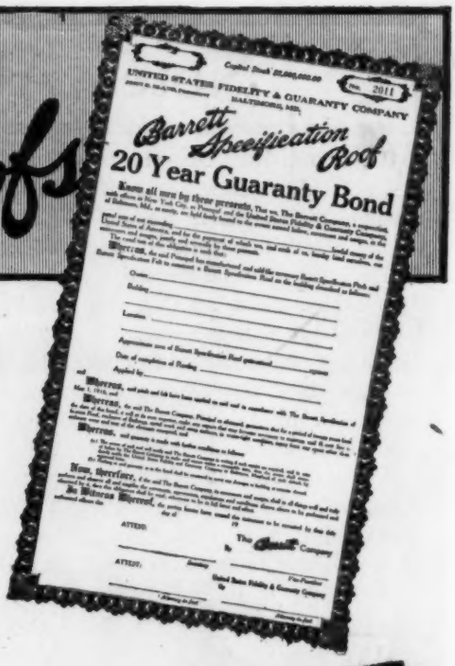
Rosin soaps nearly always tend to develop color and these soaps are particularly unsuitable for hard water. As a matter of fact, only soaps whose fatty acids are of a light color should be used, while cheaper and darker colored soaps may be used with soft water.

By reason of what has been said, it may be readily seen what takes place when hard water is used in bleaching. The soap instead of dissolving and being removed by the washing and boiling is decomposed and deposited on the fibers, causing a great waste of soap and a subsequent loss of brilliancy to the appearance of the finished product.

Never lend money to a stranger. If you must have financial transactions with him, borrow.

Advice is about the only thing some people won't take.

Barrett Specification Roofs


UNITED STATES FIDELITY & GUARANTY COMPANY
BALTIMORE, MD.
Barrett Specification Roof
20 Year Guaranty Bond

Why we guaranteed these roofs for twenty years—

THE three new sub-stations of the Commonwealth Edison Company in Chicago, illustrated herewith, carry Barrett Specification Roofs and are guaranteed by a Surety Bond for twenty years.

We know, from an experience of over fifty years, that Barrett Specification Roofs will greatly outlast the guaranteed period, and therefore do not hesitate to give this Surety Bond.

No other roofing is guaranteed in this way because no other manufacturer, evidently, cares to take the risk of having to repair and replace his roofs if they fail.

The reasons for their long life are:

First,

because they are constructed of Barrett Specification Pitch and Felt, the greatest waterproofing materials known.

Second,

because a greater amount of this waterproofing is used in Barrett Specification Roofs than in any other kind of roof-covering, and the amount of waterproofing material in the roof largely determines its life.

Third,

because under the 20-Year Guaranty Plan the roof must be constructed *under the supervision of our inspectors,* and we know, therefore, it will be constructed right.

That is why these roofs last twenty years and more; that is why we can afford to give a Surety Bond Guarantee with every one.

The 20-Year Guarantee Bond

The 20-Year Guaranty is now given on all Barrett Specification Roofs of fifty squares and over in all towns in the United States and Canada with a population of 25,000 and over, and in *smaller places where our Inspection Service is available.*

Our only requirements are that The Barrett Specification dated May 1, 1916, shall be strictly followed and that the roofing contractor shall be approved by us.

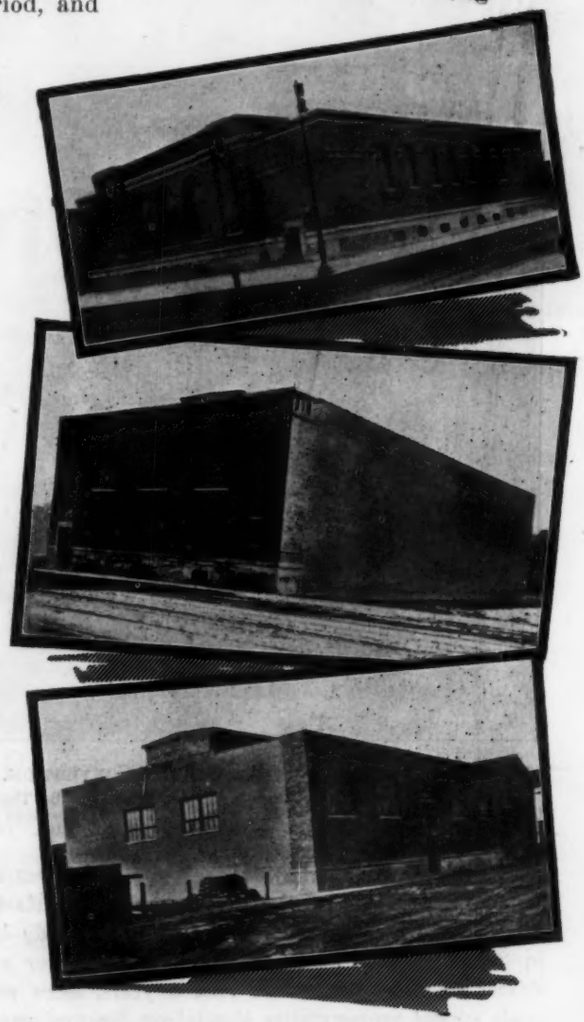
Copy of The Barrett 20-Year Specification and further information promptly furnished upon request.

The Barrett Company

Largest Manufacturers in the World of Roofing and Roofing Material.

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria

THE PATERSON MANUFACTURING CO., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.



Upper View: Commonwealth Edison Sub-Station, Chicago, Ill.
Von Holst & Fyfe, Architects; McCarty Bros., Gen. Cont'rs; Standard Roofing Co., Roofers.
Middle View: Commonwealth Edison Sub-Station, Chicago.
Von Holst & Fyfe, Architects; Calahan Mandl, Gen. Cont'r; Standard Roofing Co., Roofers.
Lower View: Commonwealth Edison Sub-Station, Chicago.
Von Holst & Fyfe, Architects; Thos. Cage & Sons, Gen. Cont'rs; M. W. Powell Co., Roofers.

Notes About Men You Know.

W. IRVING BULLARD, who is well known in textile circles, not only in New England, but also in the South, has accepted a position as manger of the textile department of the Merchants National Bank of Boston, Mass. Mr. Bullard will continue his active management of the E. H. Jacobs Manufacturing Co., and also his treasurership of the Goodyear Cotton Mills. The textile department of the Merchants National Bank, of which he has just been made manager, is a new feature of service to clients recently established by this bank, and intended to furnish full, exact and varied information to the textile trade. This service will cover exhaustively the three branches of raw material, machinery and the goods markets, plus such more general topics as money and transportation conditions. It is proposed to gather extensive data on the raw material and supplement these statistics with special reports from banking and other sources, and it is understood that clients' desires for special as well as general information will be served.

AN ECHO FROM THE ST. SIMONS CONVENTION.

Left to right: Superintendent A. T. Matthews of the Thomaston (Ga.) Cotton Mills and Frank G. North of Arnold, Hoffman & Co., Atlanta office, exhibiting their catch from Frederica Inlet. Churchill Hungerford and W. W. Sibson please note.

W. S. BLOOMER, who has for the past 24 years been connected with one of the largest rubber manufacturers, was originally a Chicago product, and previously located in Seattle, Wash., as Pacific Northwest manager of this rubber company during the past 6 years, more recently made special representative throughout the western states, has been appointed general sales manager of the Imperial Belting Co., with headquarters at the parent office in Chicago.

WILLIAM H. ALLERTON, representing the Wildman Manufacturing Company, of Norristown, Pa., was a recent visitor in Atlanta and vicinity where he was making friendly calls upon the trade. The Wildman Company, it will be remembered, manufacture circular rib knitting machinery, automatic stop motions, and electric cloth cutters.

FRED WHITE, of Charlotte, N. C., who recently gave up most of his business connections to accept the sole selling agency in this country and Canada for the Anglo-American Textile Machinery Co., has opened an office at 50 Congress Street, Boston, and will soon open an office in Canada; he will continue his offices in Charlotte and Atlanta. Mr. White will divide his time between his various offices, but during the summer will give most of his attention to New England business.

W. T. GARNER has been promoted from overseer of weaving to superintendent of the Beaumont Mfg. Co., Spartanburg, S. C.

H. C. DWELLE, former secretary of the Erlanger Mills at Lexington, N. C., has accepted a similar position with the Phoenix Mills Co., Kings Mountain, N. C.

DICK TINKHAM, DISTRICT MANAGER FOR THE ECONOMY FUSE & MFG. CO., OF CHICAGO THAT WORRIED EXPRESSION IS CAUSED BY THE PRECOCITY OF TINKHAM, JR.

DUDLEY C. SMITH has been appointed superintendent of the mills at Lafayette, R. I., to succeed the late Fred H. Clark. Mr. Smith was born in Atlanta, Ga., and traveled extensively, and was at one time in charge of the carding department for the Langley (S. C.) Manufacturing Co.

J. D. PARKER has resigned as superintendent of the Sally B. Mills, Sylacauga, Ala., to become night superintendent of the Bibb Mfg. Company, at Porterdale, Ga.

FRANCIS E. HYDE has resigned his position as night carder and spinner with the Grant Yarn Company, at Fitchburg, Mass., and has accepted a position of overseer of carding and spinning at the Shady Lea Mills, of the Rodman Manufacturing Company, at Allenton, R. I.

ANDREW FREY, superintendent of the Oneita Knitting Mills, Inc., Utica, N. Y., has been elected president of the Frisbie Stanfield Knitting Co.

J. F. HUNT will be superintendent of both the Marion Mfg. Company and the Clinchfield Mfg. Company at Marion, N. C., under W. A. Black as general superintendent.

H. H. GRADDICK has been transferred from assistant superintendent of Meritas Mill No. 1, Columbus, Ga., to superintendent of Mills No. 2 and 3 of that company.

Pyrene

KILLS FIRE
SAVES LIFE

ALL THAT REMAINS OF A PROSPEROUS FACTORY

A spark started it. Tons of water couldn't stop it.

If only they had had Pyrene —the one deadly sure enemy of a cotton fire! But they hadn't, and so only a shapeless mass of smoking ruins remained.

Will that be your story?— Tomorrow, perhaps?

Remember, fire is no respector of persons. It may be your turn next.

Place Pyrene on guard in mill, gin and warehouse— today.

Pyrene M'f'g. Co., New York

FIRE HOSE, SAFETY AND WASTE CANS, CHEMICAL ENGINES AND RECHARGES, ALL FIRE APPLIANCES

W. W. BYARS has resigned as overseer of carding at Brookford, N. C., to become night superintendent of the Harden Mfg. Co., Worth, N. C.

P. P. JONES, who recently resigned as superintendent of the Fulton Cotton Mills, Athens, Ala., has accepted a position at Chicopee Falls, Mass.

E. S. TENNENT, the well known purchasing agent of Spartanburg, S. C., has been elected secretary and treasurer of the South Carolina Cotton Manufacturers' Association.

WM. R. OWENS, who we announced last month was resigning from the Judson Mills to become connected with the Aldora Mill, at Barnesville, Ga., has accepted a position of overseer of carding and spinning at that mill.

GEORGE W. CUMMINGS has gone to Kingston, Ont., Canada, where he will take charge of the knitting department of the Kingston Hosiery Co.'s mill.

JOHN LEHMAN has resigned his position as overseer carding at Thatcher Spinning Mills, Chattanooga, Tenn., to become superintendent of the Fulton Mills, Athens, Ala.

H. L. JAY, OVERSEER OF WEAVING, AND PAUL M. SINCLAIR, OVERSEER OF CARDING AND SPINNING AT THE ARAGON (GA.) COTTON MILLS.

W. A. BLACK has resigned as superintendent of the Beaumont Mill, Spartanburg, S. C., to become general superintendent of the Clinchfield Mfg. Co., and the Marion Mfg. Co., at Marion, N. C.

BYRON BOND of Lithonia, Ga., a recent graduate of Georgia Tech at Atlanta, has accepted position as assistant superintendent of the Summerville (Ga.) Mills.

JOSEPH R. GLENNON has accepted a position as superintendent of the Cohannet Mill No. 3 of the New England Cotton Yarn Co., Taunton, Mass.

MARSHALL DILLING will resign as superintendent of the Buck Creek Cotton Mills, Siluria, Ala., to become superintendent of the A. M. Smyre Mfg. Company at Ranlo, N. C.

W. G. MCBRAY has accepted a position as superintendent of the Knox Hosiery Mill, Cleveland, Tenn.

HARRY E. DENNIE, for many years connected with the rubber industries, has been appointed general manager of The Imperial Belting Co., of Chicago. Mr. Dennie was previously located in Chicago, where he has many friends who will be pleased to learn of his success. Prior to coming to Chicago and for some time back, Mr. Dennie has operated on the Pacific coast as manager of the company's interests west of Denver. In transferring his headquarters he returns to his original field of operation and numerous old friends.

CHARLES POLLARD has accepted position as night superintendent of the Fountain Cotton Mills, Tarboro, N. C.

CHAS. A. PENDER, has resigned his position with the Durham Cotton Mfg. Co., East Durham, N. C., and returned to his former position as superintendent of the Cowpens, (S. C.) Mfg. Co.

JNO. L. DAVIDSON has resigned as superintendent of the Brookford (N. C.) Cotton Mills to accept a similar position with the Savona Mfg. Co., of Charlotte, N. C., in which he has become financially interested.

J. A. JENKINS, formerly superintendent of the Woodruff (S. C.) Cotton Mills, is now secretary and manager of the Aspen Cotton Mills, Fayetteville, N. C.

J. C. Oldham, of Lakeview, N. C., has become night superintendent of the Vass (N. C.) Cotton Mills.

JOHN RIERSON has become superintendent of the Danville Knitting Mills, Bon Air, Ala.

FRANK B. BELL, formerly superintendent of the Lowe Mfg. Co., at Huntsville, Ala., and for some time located in Atlanta, as local manager for Dodge Mfg. Co., has accepted a position as salesman for the American Moistening Co., of Boston, and will work in conjunction with J. F. Porter of that company. The headquarters of the Southern office is in the Empire Building, Atlanta, Ga.

MILTON G. SMITH of Greenville, S. C., southern representative for Jones and Laughlin of Pittsburgh, has also taken on the account of William Firth of Boston, Mass.

E. C. KENNEDY is the superintendent of the new Mitchell Hosiery Co., at Columbus, Ga. Mr. Kennedy has had a wide experience in charge of knitting plants in the North and is reputed to be an able manager and a successful manufacturer.

E. J. WOLF has accepted position as overseer of weaving at Mill No. 3, of the Beaumont Mfg. Co., Spartanburg, S. C.

W. B. HOLT, formerly superintendent at the Stonewall Cotton Mills, has succeeded J. H. Gibson as superintendent of the Eatonton (Ga.) Cotton Mills.

W. C. WOOD has resigned as second hand in weaving at Grendel Mill No. 1, Greenwood, S. C., to become overseer of weaving at Ninety-Six. S. C.

GRIFFITH M. LEWIS, manager of the Troy (N. Y.) office of the Wilcox & Gibbs Sewing Machine Co., was an Atlanta visitor recently. He was on a business trip through the South.

RALPH P. CHAMPNEY, chief engineer for the Graton & Knight Mfg. Co., Worcester, Mass., was an Atlanta visitor during the middle of the month. Our official photographer made a couple of "shots" at Mr. Champney, but inasmuch

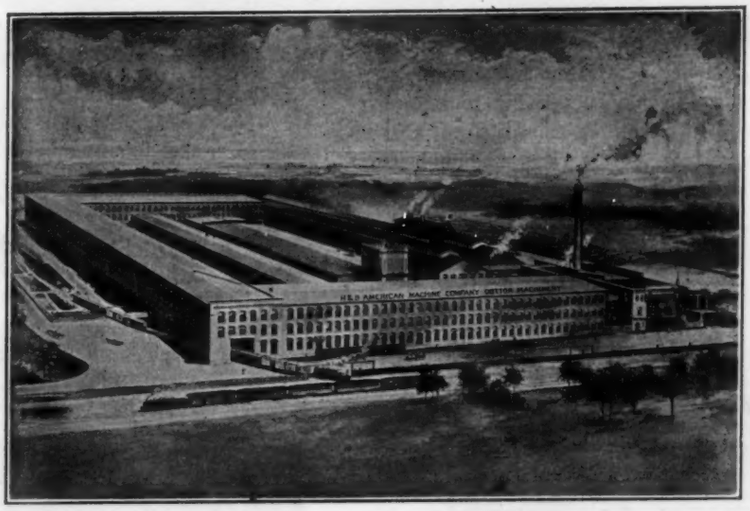
C. E. RILEY, Pres.
Boston Office
161 Devonshire Street

Southern Offices
814-815 Empire Bldg.
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

as we highly value his personal friendship, we have refrained from reproducing either of these.

RALPH M. ODELL, of Concord, N. C., agent of the Bureau of Foreign and Domestic Commerce, was recently married at Melbourne, Australia, to Miss Vera Harris, whom he met while traveling in India. After the ceremony, which took place at the American Consulate, Mr. and Mrs. Odell sailed home by the way of San Francisco. Mr. Odell was sent abroad by the Government about seven years ago to make investigations concerning textiles. He has proven a most successful commercial agent. Mr. and Mrs. Odell will reside in Washington, D. C.

J. M. HOLLIDAY, formerly cloth room overseer at the Lowe Mfg. Co., Huntsville, Ala., has accepted a similar position with the Avondale Mills at Birmingham, Ala.

A. M. TURNER, formerly of the Brancord Mills, Concord, N. C., has accepted position as overseer of carding at the Brown Mills of the same place.

MICHAEL J. GLENNON has accepted a position as overseer of spinning for the Quissett Mills, New Bedford, Mass.

JOSEPH MOBLEY has been promoted to position of boss dyer at Newnan (Ga.) Mills.

EUGENE HERRING has accepted the position of overseer of No. 2 and 3 weaving at the Meritas Mills, Columbus, Ga.

L. F. WILLIAMS has resigned as overseer of weaving at the Pickett Mills, High Point, N. C., to return to his former position as overseer of weaving at the Martinsville Cotton Mill, Martinsville, Va.

J. H. HARRIS has resigned as overseer of spinning at the Fountain Cotton Mills, Tarboro, N. C., to accept a similar position with the Borden Mfg. Co., Goldsboro, N. C.

LINDLEY PADGETT has accepted the position of overseer of weaving at the Chadwick-Hoskins Mill No. 1, Charlotte, N. C.

COLUMBUS L. PENT has resigned his position with the Newnan Cotton Mills, Newnan, Ga., to become overseer of carding and spinning at the Beverly (Ga.) Cotton Mills.

R. W. HURD, formerly of the Victor Mills, Greer, S. C., has accepted the position as overseer of No. 2 spinning at the Meritas Mills, Columbus, Ga.

H. G. LEIGH, of Rockingham, N. C., has accepted position as overseer of finishing in cloth room at the Fort Hill (S. C.) Mfg. Company.

N. H. MCGUIRE, formerly of Charlotte, N. C., has accepted position as overseer of weaving at the Franklin Mills, Greer, S. C.

HOMER B. WILLIAMS, formerly overseer of spinning at the Piedmont Mills, Egan, Ga., is now overseer of spinning, spooling and twisting at the Manetta Mills, Lando, S. C.

CHARLES DEAL has resigned his position at the Baldwin Mill, Chester, S. C., to become overseer of spinning at the Wadesboro (N. C.) Cotton Mills.

J. W. BROWN has resigned as overseer of spinning at Bladenboro, N. C., to accept a similar position at Mill No. 2, Fort Mill, S. C.

D. F. DAW has accepted position as overseer of spinning at the Albion Mills, Mt. Holly, N. C.

MORRIS L. COMEY has been promoted to the position of superintendent at the West Boylston Manufacturing Company's plant, Easthampton, Mass. Mr. Comey has been assistant superintendent of these mills for the past seven years.

Great Oaks From Little Acorns.

Emerson said that every great institution is the lengthened shadow of a single man. Enlarging upon this, two or more men of equally large caliber produce results in proportion. The Graton & Knight Manufacturing Company of Worcester, Mass., is one of the best examples of the fact that great industries are invariably the fulfillment of the aims and ideals of their founders.

About the year 1847, Henry C. Graton and Joseph A Knight went to Worcester from a neighboring town and secured employment with a card clothing manufacturer who later added a belt shop. Here they worked making belts until, in 1851, they had saved a few hundred dollars with

THE FIRST G. & K. TANNERY.

which they purchased the small belting business. This was the beginning of the concern which has since grown to be the largest of its kind in the world.

With that self-reliance, courage and persistence so characteristic of the early founders of our large industries, these two pioneer belt makers for sometime comprised the entire organization of the Company, currying the rough tanned hides and cutting them into belt strips, which they riveted or laced into leather belting. After a day's labor in the shop, Mr. Graton devoted his evenings to the bookkeeping while Mr. Knight attended to the correspondence of the concern.

When orders were few and the little shop lacked business, Mr. Graton left the currying table and belt bench and went in search of orders. Alternately walking and riding on trains, the first belting salesman traveled among the

AN INTERIOR OF THE BELT SHOP.

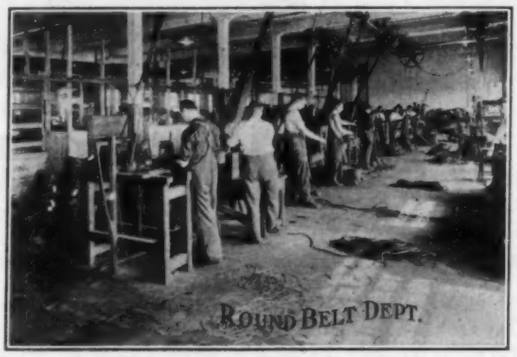
manufacturing cities and towns of central New England. Some of the same customers whom Mr. Graton first sold still have their names on the Company's books.

In 1869 an important addition was made to the force of the Company when Walter M. Spaulding was secured to keep the books, handle correspondence, and assist Mr. Graton and Mr. Knight in selling the goods and filling the orders. Mr. Spaulding is at present the president of the company, and it is in no small measure due to his business ability and good judgment that the company has shown the steady and substantial growth which has characterized it since that time.

The belts which were sent out from the shop at that time were far from the scientific product that the company is noted for today, but there were no better belts made in those days.

The first tannery was built in 1867 and had an annual capacity of a few hundred hides. Now 285,000 hides are tanned annually and manufactured into belting and hundreds of leather specialties. In place of the two small rooms where the company originated, the Worcester plant consists today of twenty buildings closely connected, and having together a total floor space of about 600,000 square feet.

Nearly 1,800 are employed in the Worcester plant alone besides an office force of 200. In addition to the traveling



THE ROUND BELT DEPARTMENT.

salesmen, there are branch stores and agencies in all the principal cities in this and other large countries. Branch factories have been established in Cleveland and Detroit, to give better service to the Western demands upon the organization.

The important relationship between scientific knowledge and practical experience was early recognized by the establishment of completely equipped chemical and mechanical research laboratories. The former thoroughly analyzes all raw materials and supervises all tanning processes. Its investigations have effected many important advances in tanning methods. The mechanical department has caused many improvements in the interest of better belting transmission, and it maintains exhaustive records of original investigations as well as practical experience extending over a long period. This department stands ready to assist all users of belting in the selection and adoption of the proper belt transmission, and will give anyone requesting it the full benefit of its valuable knowledge.

One of the prime factors in placing this concern in the lead among belting manufacturers is the fact that they have originated and conscientiously maintained rigid standards of quality. They manufacture a variety of different brands, each from a particular selection of the hide, and each suited to a different belting need. These so completely cover the entire range of belting requirements that they form a series. After years of careful classification and steady improve-

Admiralty

NEW RIVER SMOKELESS Coal

Great heat unit efficiency, combined with unusually clean, free burning, smokeless qualities, make ADMIRALTY Coal the equal of the best known grades of Welsh Coal. It is a semi-bituminous, low volatile product, easily kindled, and leaves a minimum amount of ash residue. It costs less than anthracite.

All large users should test ADMIRALTY, which is used by the leading navies and transportation companies of the world.

Analysis made by the United States Government of twenty-five consignments of ADMIRALTY for barges and steamers at Hampton Roads, approximating 43,000 tons, resulted as follows:

Moisture,	2.6	Vol. Matter,	18.9	Fixed Carbon,	76.5
Ash,	4.5	Sulphur,	.88	B. T. U.,	14,921

The Chesapeake & Ohio Coal & Coke Co.

(Selling Agents for New River Collieries Co.)

EXECUTIVE OFFICE, 120 Broadway, New York City

WESTERN OFFICE
First National Bank Bldg.
Cincinnati, Ohio

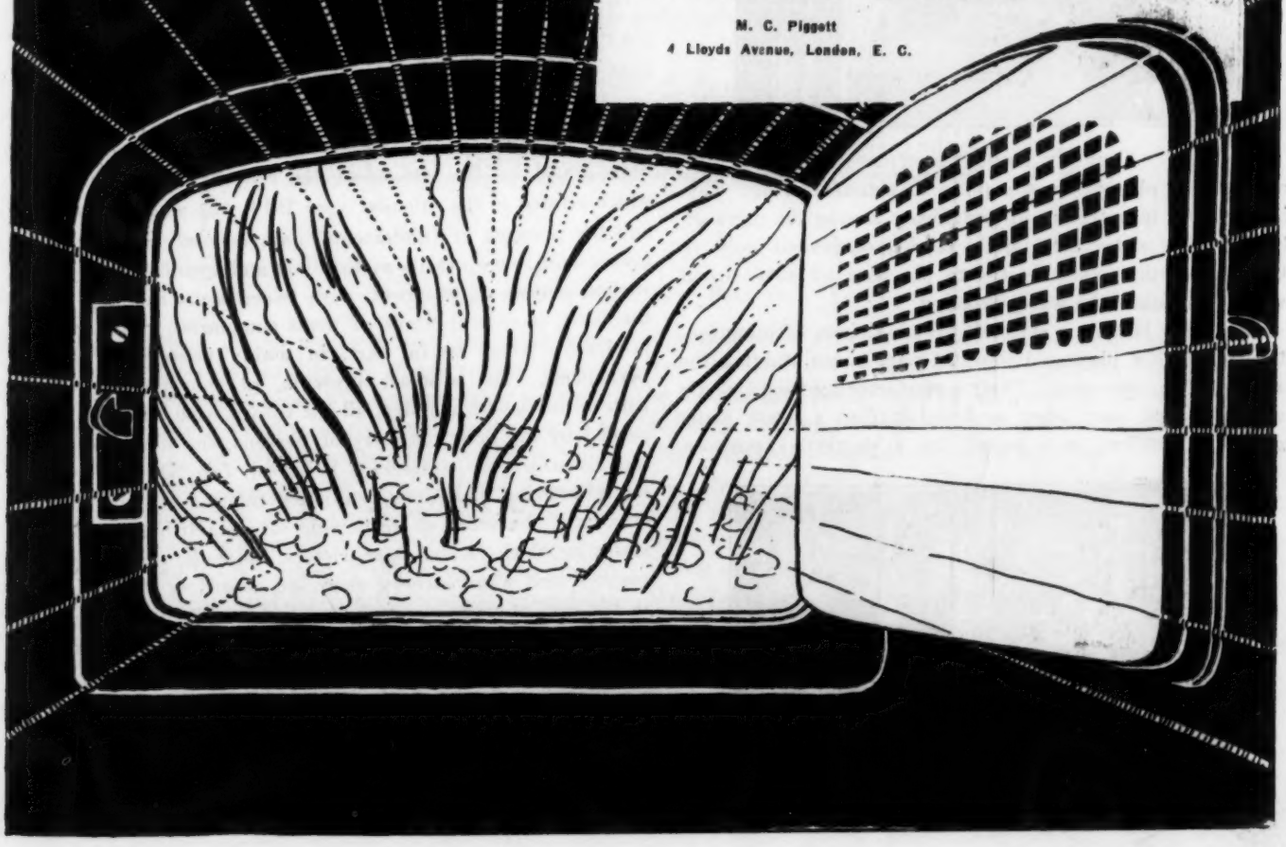
SHIPPING OFFICE
Sun, W. Va.
Eccles, W. Va.

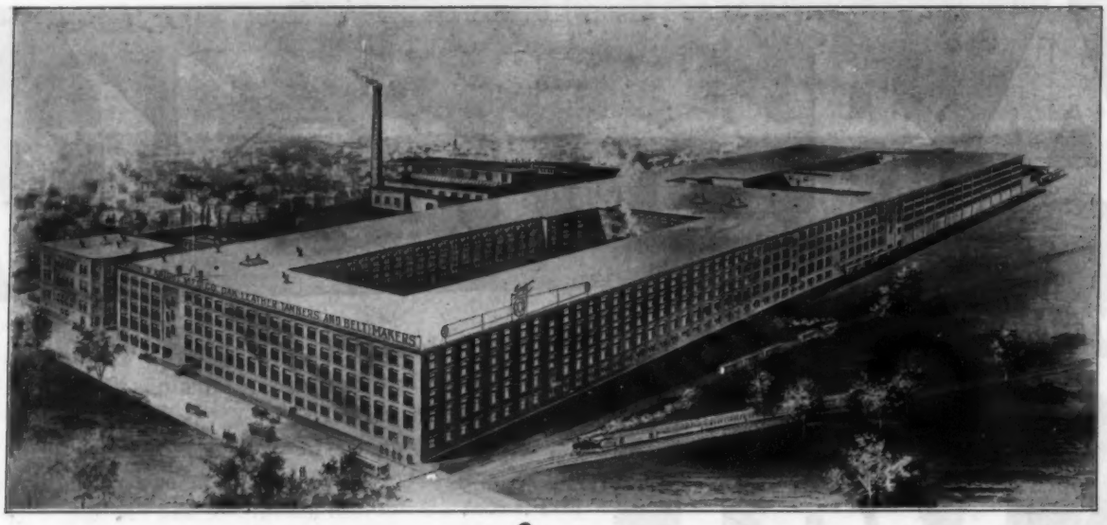
TIDEWATER AND EASTERN OFFICE
Board of Trade Building
Norfolk, Va.

FOREIGN AGENTS

SOUTH AMERICA: Chadwick, Weir & Co., Ltd., 25 De Mayo, 158, Buenos Ayres
W. H. Newman, Trafalgar Bldgs., Northumberland Ave., London, S. W.

M. C. Piggott
4 Lloyds Avenue, London, E. C.





The Graton & Knight Plant as it is Today.

ment, the characteristics of these brands have been fixed, and they are generally accepted as the standards of quality in their line.

In order that no manufactured leather of any nature may leave the plant below the standard of quality which has been decided upon, a very thorough system of inspection has been in operation for many years. Visitors to the plant are surprised to discover the importance which the

The Cut Lace Department.

management places upon this phase of manufacturing. This has resulted in a feeling of confidence among the users of belting sold under their trade marks, equivalent only to that satisfaction which comes to the user of silver upon which is stamped the word "sterling."

Although belting is still the principal item of manufacture, specialties play an important part in maintaining the success of the company. Their manufacturing facilities are unlimited and they select and standardize a great many grades of leather, each suited for a particular purpose.

Where the Straps Are Made.

Their production of textile and automobile strapping of all styles and sizes runs into large proportions. Their clutch leathers are used in hundreds of thousands of automobiles all over the country. They annually make millions of leather packings and gaskets for various purposes.

The Worcester Counter Company, which is a department of the concern, in itself constitutes one of the largest plants in the country manufacturing cut stock for shoe factories. The Persons Manufacturing Company (another department) annually turns out thousands of fine bicycle and motorcycle saddles. There are numerous other departments, for there is hardly anything manufactured from oak leather which the company is not equipped to manufacture.

There is no better proof of the success of the policy of the founders than the fact that Graton & Knight belts and leather goods are used in the farthest corners of the world.

The abstract of the census of manufactures has just been issued by the bureau of the census. This inquiry, which related to the calendar year 1914, was made in 1915, and the primary or fundamental data derived from it, together with some details as to kinds and quantities of the various classes of products, were issued some time ago in the form of several series of press summaries which were published, whole or in part, in mainy newspapers and periodicals. The abstract presents, in convenient form, with an alphabetical index, all the information that will be needed by the great majority of persons who have use for the manufactures statistics. If gives, for 340 separate manufacturing industries, statistics relating to number, size, and character of ownership of establishments, and states in which located; proprietors, officials, salaried employees, and wage earners, classified according to sex and, in the case of wage earners, according to whether 16 years of age or over, or under that age; salaries and wages paid, power used; fuel consumed; cost of materials; value of products; quantities of principal products; and various other items. Statistics somewhat similar in scope but in less detail are given, with reference to all industries combined, for each state and geographic division and for each of the leading 130 cities.

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

Stripping Cards.

EDITOR COTTON:

The thought has occurred to me that an article, on card stripping, would not be out of place at this time, as it is one of the most necessary operations that comes up in textile plants, and the question might be asked, why strip the cards?

This is to strip them of the impurities that have been collected between the cylinder and the flats, that have accumulated during the time the cylinder and the flats have been working on the cotton while it has been passing through them, the flats carry the impurities out, and a comb which is placed on the front of the flats, keeps it combed off and rolled around a roll, while the cylinder and doffer have to be stripped, the roll which is used is shown in the cut, Fig. 1.

The stripping of cards depends on the grade of cotton used and the weight of sliver carded. Take for a sample, 50 grain sliver, carding about 150 pounds per day, on middling cotton, the cylinder and doffers will not require more than two strippings per day which usually are done just after starting in the morning, and just after noon, lower grade cotton, or carding on coarse counts, or running a high production gear will require more stripping. This must be determined by closely watching the work as to the filling up of cylinders and the little neps which will show up more and more on the doffer and the sliver will become more and more neppy and cloudy, looking as if it was being "chewed-up."

Cylinders will become "heated" by being filled beyond the carding capacity, and when accustomed to having the cylinders heat one can discover it in passing by them by their smell, and also by the card running slower. In order that the card shall do its full duty it is necessary to have the flats set very close to the cylinder, as the impurities are stored into the cylinder and doffers, in the carding the fibers free from these impurieties, the little neps, trash and other foreign matters become imbedded into the cylinders.

The cylinder clothing now under this strain is where the stripping must be done. Consider the tension that is on the clothing. In Fig. 1 is a stripper roll which does the work. It is not covered in the "spiral" form, but is covered squarely around the roll in strips. In covering start at the end of the roll and tack the first end, stretch the "Stripper Fillet" around until it comes to where it started and put the two ends together; tack and cut the fillet; then start a new round skipping a few inches so as not to have the connections too close together. I usually have the ends to meet about every sixth round, as is shown in the cut, this puts the piecings in different places and divides up the space.

Now, why is the fillet put on in this way? Why not put it on in the old-fashioned way, the spiral form, commencing at one end and winding it around and around until the roll is covered?

The reason is this, the cylinder fillet is put on on a spiral form and to put the stripper fillet on in this way would make two spirals running together, and eventually work the cylinder fillets to the extreme edges of the card; this causes the cylinder fillet to budge-up and blister, and face the flats. This is bound to happen, for the cylinder is loaded, and the stripper must be set sufficiently deep to force its way through fillet to get out the impurities that have become imbedded into the clothing.

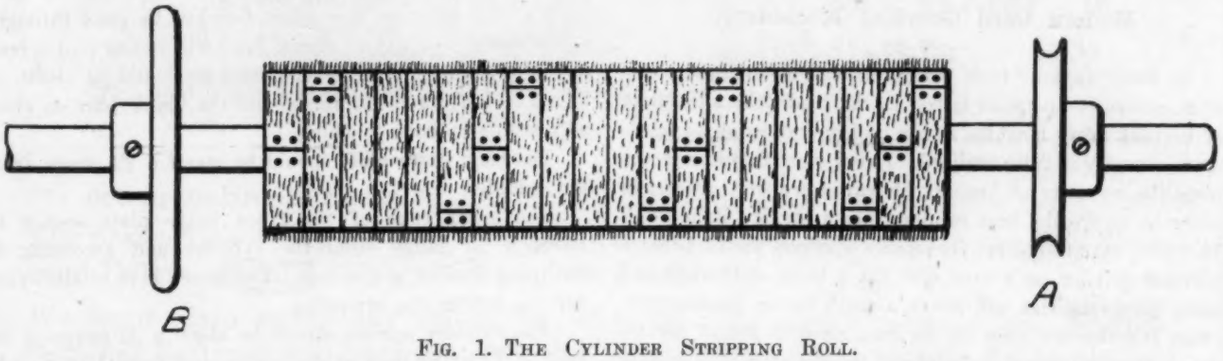


FIG. 1. THE CYLINDER STRIPPING ROLL.

This is more especially the case when doing heavy carding. (A) on the cut, shows where the band is put to run the stripper roll which is belted from the cylinder main pulley on the right hand side of card. (B) is the pulley the "Tail-Stripper" handles in assisting the "Head-Stripper" (who handles the banding end) in taking the roll from the cylinder to the box where the strips are stripped off the roll.

The wire on the stripper roll should be looked after very closely and when the wire becomes weakened or mashed down it should be replaced with good wire, for

it is much cheaper than poor carding. Cards not properly stripped are bound to make poor carding.

In putting on a new stripper roll that has been recovered it should re-set into the stands on the cards to make sure that the roll goes sufficiently deep to clean the cylinder of its load.

If the stripper roll has to be put on the cylinder the second time to get the cylinder clean, be sure that the cylinder is not revolving, for if it is the cylinder revolving will run against the wire on the stripper roll and that knocks the point off the wire on the cylinder fillet.

In setting a new stripper roll the cylinder must be stopped and the stripper roll put into its stands and turned by hand, a few quick rounds into the cylinder and the space that should be across the cylinder is about 2 1-2 inches. Should this not get it clean, then pull down a little more but care must be taken not to get the roll too deep, as it will damage the foundation of the cylinder clothing.

The stress in this article has been put on the cylinder, as the cylinder has the burden to carry. The doffer must be stripped just as clean as the cylinder, but the doffer is more to take the sliver from the cylinder in a fine, even sheet and deliver it to the comb on the front of the doffer where it is condensed and put through the calender rolls thence into the sliver cans.

It is also very important to break the end down at the coiler head when you are stripping out the cylinder and doffer, this stops the flying trash from going into the sliver, and also allows the end to run long enough to let the cylinders fill and thus avoid light sliver.

Carder (Georgia.)

Modern Card Grinding Machinery.

In these days of high prices, as well as in those times when severe competition is felt in the trade, the advantage of keeping every machine in the mill operating at its maximum capacity is fully realized. Every manufacturer recognizes the necessity of keeping his cards properly ground in order to secure the best results from a quality standpoint. However, manufacturers frequently overlook the fact that a traverse grinder on a card that has a large stiff shell and other good qualities will prove a much faster working machine and thereby keep the carding machine out of service for a shorter period than would be the case if a poorer quality of grinding equipment were used.

A very interesting illustrated descriptive catalog of card grinding machinery has recently been issued by B. S. Roy & Sons, of Worcester, Mass. In this catalog they have shown not only their well known Roy traverse grinder which is suitable for cards of any width whatever and is a large, stiff, fast working machine, but also they have introduced some new machines that are well worth examination. A traverse grinder for napping machine rolls is one of these specialties, as well as new style shear grinder which will grind both fly and ledger blades at the same time. Also a patent adjustable grinding wheel with a differential motion, only one belt being required to drive the grinder and the motion traversing the grinding wheel. They also build some other machinery and grinders that are well illustrated by the booklets which may be secured by any mill man for the asking.

Important Points for the Carder.

EDITOR COTTON:

The watchword in the mill today should be, "Watch Your Cards." Later on I will explain why, but just now I will rehash the settings.

The main purpose of the cards is to remove foreign objects from the cotton after it has been through the pickers. In accomplishing this a certain amount of short fiber is also removed.

As this letter is to give an idea of the manner in which the card attains its greatest efficiency and the relations of the settings to the success attending, I shall not discuss the construction of the cards as the reader has that knowledge. The parts upon which the duty of carding rests are the screens, cylinders, flats, mote knives, stripping plates and licken-in.

On account of the construction of the feed plate this may be set to the licker-in with a 10 gauge for all cotton up to 1¼-inch. Over 1¼-inch it may be set with a 12 gauge.

There is greater danger of setting this plate too far away than there is of setting it too close. When at too great a distance the licker-in will tear off the cotton in bunches which will sometimes throw the knives out of position or damage the clothing.

On account of the nose of the feed plate rounding off, there is but little danger of too close a setting as long as the licker-in teeth and feed plate do not touch.

The mote knives should be set as close to the licker-in as possible without touching and should be in a nearly upright position. If slanting too much they sometimes give sufficiently to allow the small bunches to pass through, which has a tendency to throw the mote knives and screen out of position. The licker-in screen should be about ⅛ of an inch from the licker-in and the blank part as close as possible without touching.

The back knife plate should be about a 22 gauge from the cylinder.

The lower edge of the front knife plate should be about a 29 gauge from the cylinder and according to stripping desired at the top. The closer it is to the cylinder the lighter the stripping.

The cylinder screens should be about a 22 gauge at the back, 1-32 of an inch at the center and from 1-16 to 3-16 at the front.

If there is good fibre in the flat strippings, the top of the plate is too close to the cylinder and should be moved farther away.

In giving these settings it is being assumed that the wire is sharp and evenly ground, that the cards are on a firm foundation and in good condition generally.

The licker-in should not be set to the cylinder any closer than a 10 gauge. Setting it closer will drive the cotton below the knee of the wire. The fibre should be caught on the front of the cylinder wire, if forced in deeper it will fill the cylinder up and as the cylinder is revolving swiftly the centrifugal force has a tendency to pull the fillet from the cylinder thus stretching it.

Also set the doffer up to a 5 gauge if you have a grinder capable of grinding wire evenly. If the licker-in is set right the fibre will be on the front of the wire and

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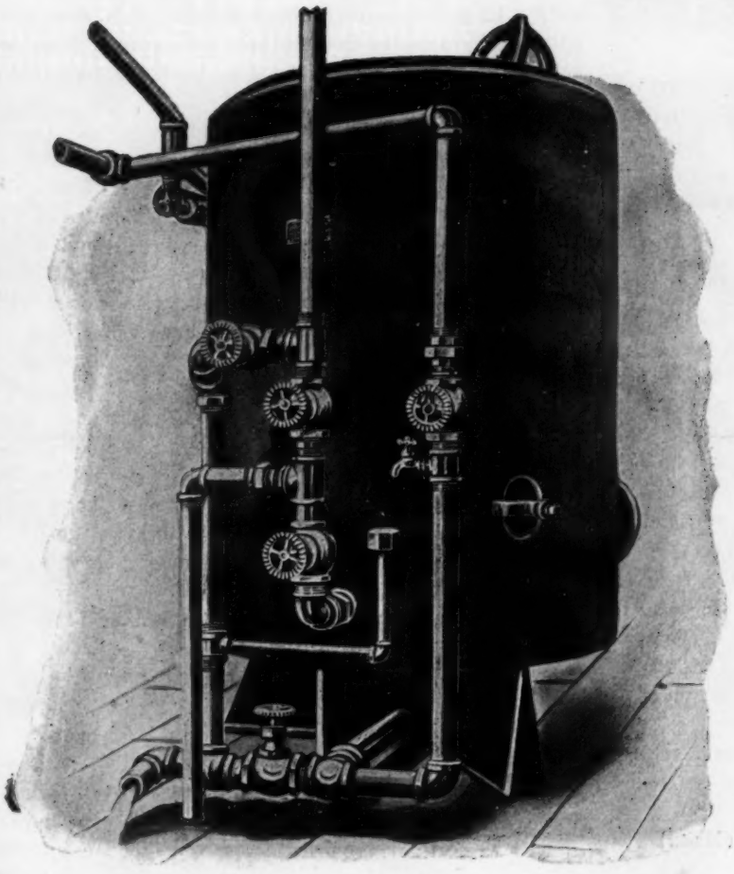

Any textile mill man who will send us his views on "Why Textile Mills Should Use Soft Water" is eligible

We are preparing our catalog and desire the views of the "boys on the firing line." The best article will go into our catalog and the writer will receive the One Thousand Dollar REFINITE Water Softener shown above.

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Make no mention of REFINITE in your article. Your subject is *Why Textile Mills Should Use Soft Water.* State your own opinions from your own experiences.

The winner will be announced in this paper September 15. All communications must be in by September 1st and must be accompanied by the following information:

(1) Name and Address of your company. (2) Your position with company.

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if the doffer is set right the fibre is taken off, leaving a comparatively empty cylinder.

I know a grinder that has been grinding cards 35 years, who is getting an overseer's pay simply because he has recognized the above fact. He grinds the doffer and cylinder perfectly even. He sets the doffer to a 5 gauge, and 5 months after his settings have not varied excepting what he has ground off. If he finds the doffer is a 7 gauge from the cylinder he does as follows:

Tightens all the setting nuts. Starts his cylinder revolving forward. Loosens the front adjusting nut a trifle, tightens the back setting nut up solid. Revolves the doffer in the direction it runs, slowly. Carefully he tries his gauge. An amateur should not try this as he is liable to lose his hand or burn his gauge. If the doffer is still off he sets the end of an iron bar up against the doffer box and gives it two or three smart blows and then tries his gauge. If it is a good 5 gauge he tightens up his forward adjusting nut so as to have his back-lash away from the cylinder. If his doffer is two close he loosens up his inside adjusting nut, puts the bar against the doffer box end, and hammers as before. As the back-lash is the reverse way, the doffer will move *away* from the cylinder. With a setting made in this way, a doffer will never work nearer or away from a cylinder, but will always *stay* the same.

Great care should be taken when making this setting as it requires care and is accompanied by danger. If there is a high spot on the doffer or cylinder be finds it this way and thus avoids facing the wire.

If your cards are in good condition, set the flats up to a gauge, loose at back, tight at front.

Have the wire sharp, evenly ground, and as close settings as possible and you will not have nitty or cloudy work or make excess waste.

G. E. T. (Mass.)

More on Cotton Mixing.

EDITOR COTTON:

A letter in these columns in the April issue signed by "Carder (Mass.)" contained the information that a single bale of short staple in his mix caused his break to drop almost to nothing and his sizing to vary considerably. In order to emphasize this statement he should have stated perhaps just how many bales he used in his mix and how much difference there was in the staples.

I should like to take issue with him upon the above statement, however. The only way that his break could go all to pieces from a single bale of short staple would be from an improper mixture of the stock. Were that bale of short stock thoroughly mixed in with a number of other bales, while his break might possibly fall off a few pounds, there would be no such catastrophe as he stated. It is my opinion that the single bale of short staple was not thoroughly mixed in with the other bales but was probably sent through alone. Unless one is constantly on the lookout, it will be found that the men on the openers will be apt to run through first one bale and then another instead of taking only single layers from each bale and putting these together into the openers.

I have run mixes where only four bales were used to the opener and four openers—thus making a total of sixteen bales. We were running 1⅛ stock. Occasionally it was necessary to get rid of a bale of short staple which the treasurer did not want to bother to have shipped back. By mixing this bale in gradually it was never felt. At present—having an abundance of room—we are making a mix of 100 bales at a time and getting an even running yarn. Such a large mix is of course impossilbe in a good many mills but by insisting that the help take a layer from each bale—keeping all bales on the same level—no such trouble as "Carder" experienced will result.

Another hint for the beginner might be—watch the section beams for streaks. If one is using tinges in with white cotton, it is absolutely necessary to be on the constant lookout. Otherwise one may get in too many of the tinged bales and get a section beam which would be full of stripes of dark and light cotton. In a sheeting mill with which the writer was connected at one time, using Strict Middling cotton, from 10 to 15 per cent of light tinges was put in the mix producing a beautiful color on the section beam.

In conclusion I wish to state that I thoroughly disapprove of mixing staple to any extent, although I have known of men who seemed to think this could be done and that it would never be felt. It is bound to show up in the spinning however. The top clearers will show an increase in fly and it will be impossible to keep section beams on the standard.

Observer (Mass.)

About That Card Setting.

EDITOR COTTON:

I have enjoyed for a number of years the writings of "Wash" (N. H.) on different subjects, especially that of the flyer-lead on the roving frames. I was very much interested, and think he scored some very good points from his way of expressing them. With interest would I watch "Wash" attack different writers, and the cunning way he had pulling over the other side of the subject made it an educational feature, and drew many a good idea out of the opposing writer that otherwise would have never come to light.

I had about come to the point of patting myself on the back for escaping him thus far from criticising what few articles I have contributed to COTTON, until I received my July issue and began reading through the pages of a shot at me, as well as "R. W. A. (Ala.)" and "Ted (N. C.)" in the January issue of COTTON. I did not have but one thought coming, and that thought was that I had to defend myself.

The first attack he makes is the "card flat" settings. He does not like the setting of the front flats close and gradually opening up until reaching the back flats, which will be 2/1000 gauge different from the front flats. "Wash" should not grade a card-grinder's work according to the way in which he explains it to the overseer, or for not being able to fully explain it intelligently, for not all grinders have the gift of speech to go into details of textile work and tell what different effects certain settings will have; they know it and can make the machine do the work, yet they cannot tell all about it.

For instance, I have two men under me that are what I

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call extra good men. One of them is fixer in the picker-room, and the other is a card-grinder, and is doing my re-drawing, and putting new clothing on the cards. Neither has any education to amount to anything, and naturally are not good talkers of what machinery will do in a theoretical way. At different times they have wanted to do certain things and would hardly be able to make me understand just what they were going to undertake (some experiment they would think of), but on the jobs where they work, they are giving as near perfect satisfaction as is possible. Their work is good and they are very watchful. The picker-room man is looking after 48 pickers; the card man is looking after 224 cards, that is, the putting on new, and re-drawing the old fillets that will run longer, and I will put this card man against any erecting man that any card builder has on the road!—but, back to the settings.

In giving my reasons for setting the flats as I wrote, or as I am doing, is, as I see it, that the cotton as it goes onto the cylinder first, is coarse and lumpy, more or less. It is drawn down finer and finer as it proceeds to the front flats, the particles of foreign matter that we are after is being caught in the flats as it is conveyed to the doffer for taking off, it would seem that in it going first to the cylinder, it being coarse, that it would have to be drawn down to the fineness, and the cleanliness which is required. That being the case, it seems to me that we must make the space in which it travels closer-and-closer as it goes through to the delivery end.

I look at the flats as I do the rest of the machinery which it takes to reduce the cotton to the required size for spinning yarns. Take the three processes of picking; the cards; the drawing frames; and the different roving frames that are used, they all have a certain duty to perform. Why not the different flats. In his way of setting, he don't set so that the first flat will prepare it for the next. Each flat should do a bit, the next a bit more, and so on to the front flats gradually being drawn to a closer setting so as to take out anything that the preceding flats failed to catch.

The setting of the flats depends on the weight of the laps that I am running, and the weight of the laps depends on how the pickers keep up with the cards. "Wash" says, that no carder will run the laps heavier than 12 ounces per yard. Theorectically, that is good policy, but practically, we have to run them so that they will keep up with the cards, let that be what it will, until we can get the management to buy more pickers.

I use a 12.75 ounce lap, and it is all my pickers will do to keep up with my cards, I would like to use a lighter lap but I can't do it. Our numbers run from 10's to 14's; the card sliver weighs 53 grains; my settings for the first flat on the back is, now, 10/1000 gauge, gradually drawing down a 7/1000 on the last flat at the front of the card.

When a man takes a job he has to run what machinery the mill has in it, even though it is not just what he thinks it should be. All these conditions has to be dealt with as best the carder can arrange them to furnish the next process with stock on which to run, and when the mill officials see fit to buy more they will do so.

I cannot agree with "Wash" on his 3/1000 gauge for the flats he mentioned, unless they have an absolutely steady flooring; the cards are newly covered; the frames of the cards perfectly braced and steady; the sliver very, very light; the pickers spreading the cotton even and very smooth; and the knock-offs on the pickers so set that they will not let the slightest thick place go through in the lap, making a very light lap with good, clean, select cotton with none mixed in that is the least bit damp, or green.

"Wash" says, that there is no reason for high and low flats, and when in such condition they should be repaired immediately, I admit that there should not be, but when found it depends on what length the wire is, whether they should be taken off and new ones put on. If the wire is high enough to permit it they can be ground down and saved by the drum grinder roll, using a pulley on the arch of the card to take up the slack of the grinder roll band. This assures that there is no slip of the grinder roll, and the slipping of the grinder roll band is what causes the flats to become uneven, if they are even when first put on.

In regard to the draft circling the cylinder, "Wash" says, the back of the cards should be packed to prevent draft. How can a cylinder, or any drum, run without draft. Take the smallest edge pulley and it will creat a draft. Nothing can run without it. Its in there and you have to prepare for it, and my idea now is, as it was in the article he mentioned. I admit that fibers of the average length will not blow out like the shorter ones, but the idea is to save as much as possible of those best short fibres. When spinning numbers, say from 10's to 20's, "Safety First" on the percentage of waste. Take chances on the shortest falling out but keep them in as long as possible where it does not hurt the selling of the yarn or cloth (and, by the way, we are getting the top price on our products, our grade of cloth stands among the best in the New York markets).

"Wash" says, he is on a fair size job, and well satisfied. I can say the same thing, I am on the same job that I started on 17 years ago next January. A 64,444 spindle mill, and the majority of my card clothing and flats are the ones that were installed in 1900, and our cloth ranks with the best. But I am still open to learn of anything good, and try to keep posted on as much as I can by watching everything new coming out through the pages of the textile journals. I give these ideas a tryout, and am willing to exchange my ideas and my findings of such as I see them. It is one man's opinion, worth that, and no more.

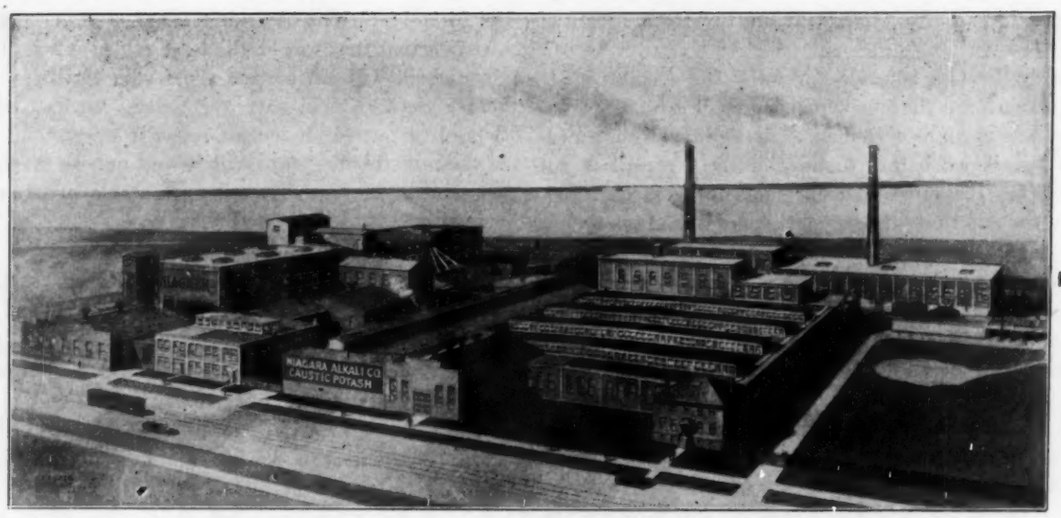
In conclusion, I will state that I am going to set aside 28 cards on one class of work as "Wash" argues, and give his method a fair test; then I will let him know how I find them.

Carder (Ga.)

A Ruling on the Child Labor Law.

Commissioner E. T. Watson of the South Carolina Department of Commerce and Industries has issued a circular to cotton mill managers on the enforcement of the new national child labor law. We believe it may be of interest to many manufacturers in other states. It reads:

In view of the nearness of the approach of the time when the operation of the Federal Child Labor Law will become effective, with all its dangers for both employer and employee, it becomes necessary to request and admonish the mangement of every textile plant in this state to issue rigid



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Liquid Chlorine is a distinct advance in bleaching agents. Its advantages over the old method of bleaching are so many that the mills that have adopted Liquid Chlorine would be loath to return to the old method.

By the use of Liquid Chlorine the entire quantity of chlorine agent is available for bleaching purposes. 100 pounds of Liquid Chlorine produces 100 pounds of available chlorine, of 100%, as contrasted with 35% of bleaching powder.

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Yarns and cloth bleached with Liquid Chlorine have a much softer feel and a positive increase in the tensile strength of the goods is obtained. Less acid (or sour) is required which eliminates tendering and also results in a large saving in the amount of wash water required, and no odor is apparent in the goods.

You need no material changes in your present method of bleaching to adopt the Liquid Chlorine method. It is far simpler and easier to handle. It is a nicer, cleaner, more efficient and scientific method.

It is more economical, not only from the quantity standpoint, but from the standpoint of freight charges, as 1 pound of Liquid Chlorine is equal to 4 or 5 pounds of bleaching powder.

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instructions to each superintendent and overseer upon the following points:

When application is made for work for a child under sixteen years of age, the superintendent shall ascertain from the parent, guardian or custodian of the child whether a permit was ever issued before to the child. If permit is not produced, then the superintendent shall apply to the Commissioner to ascertain whether such permit had ever been issued. In no instance must a new registered number sworn statement form be isued to the parent until this has been done.

When the parent, guardian or custodian claims that a "mistake" as to age was made in an original paper, under no circumstances issue a new numbered statement form. It will not be considered. Make a statement of the case, referring to the original permit number, or sending in the permit itself, and accompany such statement by a sworn affidavit made in the ordinary way from the physician attending the mother at the birth of the child. No other affidavit as to the date of birth will be accepted, and it is useless to send them in. If the physician's statement sustains the claim the change will be made on the statement already on file, and on the original held by the mill of issue, and a new permit will be issued.

When a notary probates a statement, as required by law, it is his duty to take every possible precaution, such as demanding Bible records, insurance papers or other good evidence, to see that the statements made are correct.

Parents, overseers and others should be warned as to the extreme risk they run in making or conniving at the making of a false statement as to age. For the parents, when convicted, it means the Federal prison; for the employers it means heavy punishment and fine in the Federal Court, and the ruling of the products of the plant out of interstate commerce.

Under the new Federal law the State Department works with the Federal authorities. Already many child labor cases have been set aside for fullest investigation by the Federal officers, even in instances where "mistakes" of age have been allowed corrections.

I feel that is it my duty to sound this note of warning, and to ask every mill management to see that the instructions herein are obeyed to the letter.

I am forced to advise every employer of child labor, under the law, that the *actual possession of the permit* issued by the commissioner is necessary before any child can be put to work. This permit is the chief requirement of the law, and no employer can presume that it will be issued, and go ahead and put the child to work. If he does so he *knowingly* violates the law, and will surely be indicted upon detection.

Disregard the printed instructions heretofore on the back of permits, that the children or their parents shall be the custodians of permits. Henceforward the mill will take up and hold the permit during the period the child is employed in the plant, turning it over to the child when employment ceases.

Under no circumstances will the federal government give any consideration to a parent's sworn statement. I would earnestly advise, therefore, that in taking sworn statements to be sent in, henceforward every mill accompany the statement with a sworn affidavit of the attending physician at time of birth as to the age of the child. I am satisfied that that will be the least evidence that the federal government will accept, and those who get these affidavits before Sept. 1. will save themselves much trouble. On Sept. 1, otherwise, it looks now as if every child employed in the mills in this state will be put out by the federal officers until they qualify with acceptable proof, such as is indicated.

Nitrogen From Air.

When the war challenged the attention of Americans to their more or less complete dependence on foreign countries for many commodities indispensable to their welfare, it gave a powerful impetus to the creation of new industries. Captains of American industry were spurred to activity by that greatest of forces, necessity.

Under the pressure of war conditions, great development has been witnessed in the chemical field. The creation of a coal-tar industry such as America now enjoys —with its ramifications into practically every industrial undertaking in the community of American effort—might well serve as the proud boast of a generation. It has actually been accomplished in a short two years. A further important step toward industrial independence is now indicated in the announcement that the fixation of nitrogen from air has been accomplished on a commercial basis.

While it was anticipated that in time a fixation process would be discovered which would be commercially practicable, the announcement that nitrates so produced are today actually on the market comes as a startling surprise. Before the war, we were dependent on Chile for nitrate soda and nitric acid—commodities essential in time of war for the manufacture of explosives and at all times for numerous essential chemical manufactures. The development of an American coal-tar industry indeed relieved conditions somewhat by supplying us in 1916 with 81,000 tons of ammonia. But how far short this supply fell of our requirements may be seen from the statement that our normal annual consumption of inorganic fixed nitrogen (ammonia and nitrates) for fertilizer and other purposes amounts to about 180,000 tons. With our participation in the war, our needs are of course tremendously increased.

The announcement of a new source for nitrates, therefore, could not possibly have come at a more opportune time. To an infinitely greater extent than in previous wars, success in the present confliet depends on an abundant supply of munitions and food. And in agriculture and munitions manufacture alike, the nitrates are an indispensable factor.

The American Nitrogen Products Co. enjoys the distinction of being the first to succeed in making the air subservient in this special way to the industrial needs of the nation. Their sodium nitrate, produced through a fixation process, is now being offered by their sole selling agents, Marden, Orth & Hastings Co. of New York. Thanks to this new demonstration of American resourcefulness in meeting critical needs, our preparations to play a part in the war worthy of our traditions may now proceed without and danger of depriving our agricultural and other industries of necessary supplies.

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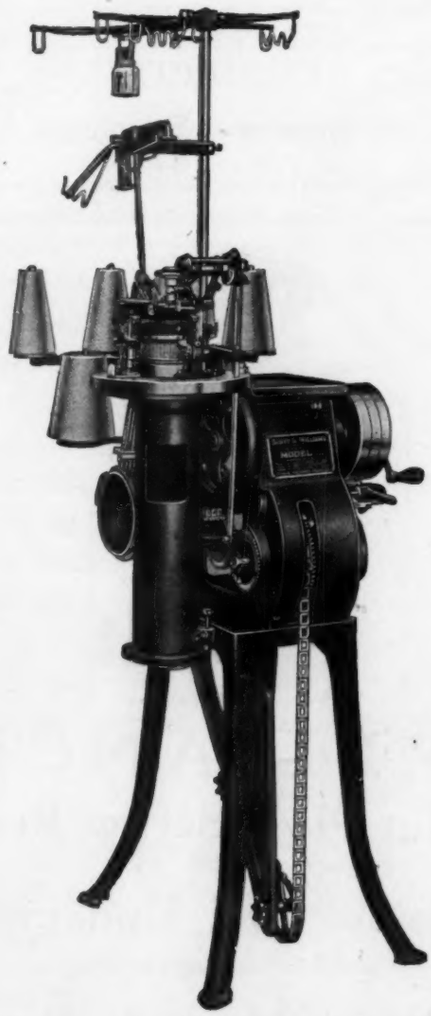

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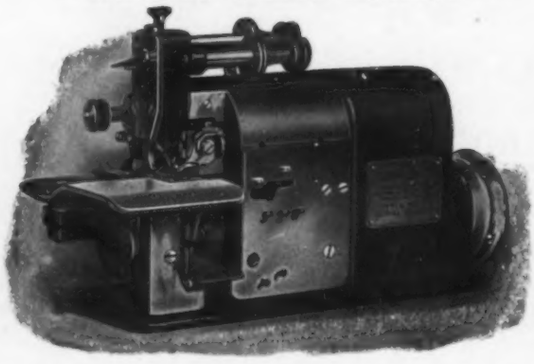

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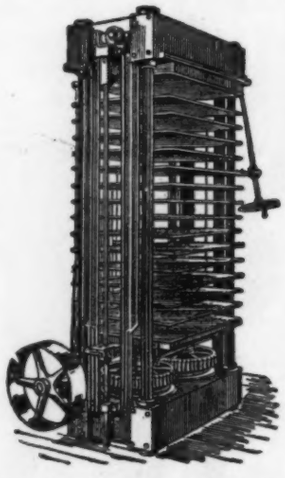

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Making a Picture of Figures

BY RALPH H. BUTZ.

It is a well known fact that the graphic form of presentation is in universal use among engineers, scientists and statisticians, and the manufacturer is also beginning to realize that the graph is an invaluable aid when intelligently used in the presentation of those figures relating to his business.

The graph, as it is generally called, has almost no limit to its practical usefulness. It has occasionally been designated as the businessman's barometer because, through its use, it is possible to make more accurate forecasts for the future. The reason the manufacturer can find it of especial benefit is because the results of his business for any length of time can be accurately portrayed in the form of a picture. That is what it really is to him, a picture of figures.

The mind can more readily grasp the relative details when seen in this form. Each man thinks in terms familiar to himself when he sees a picture, but when he reads typewritten reports of statistics he must invariably adapt his method of reasoning to that of the man who rendered the reports, which often leads to confusion.

In many instances it is possible to chart on one graph all the vital figures pertaining to the business in a given time. At a single glance the manufacturer is able to tell when the plant was at the highest state of efficiency, and at the lowest; how the cost of production varied and what effect these variations had upon the profits. He can see the relation of one class of statistics to another, and how differences in one class affect all other classes. He can view the accomplishments of the business as a whole and make intelligent efforts to remedy the causes for low efficiency.

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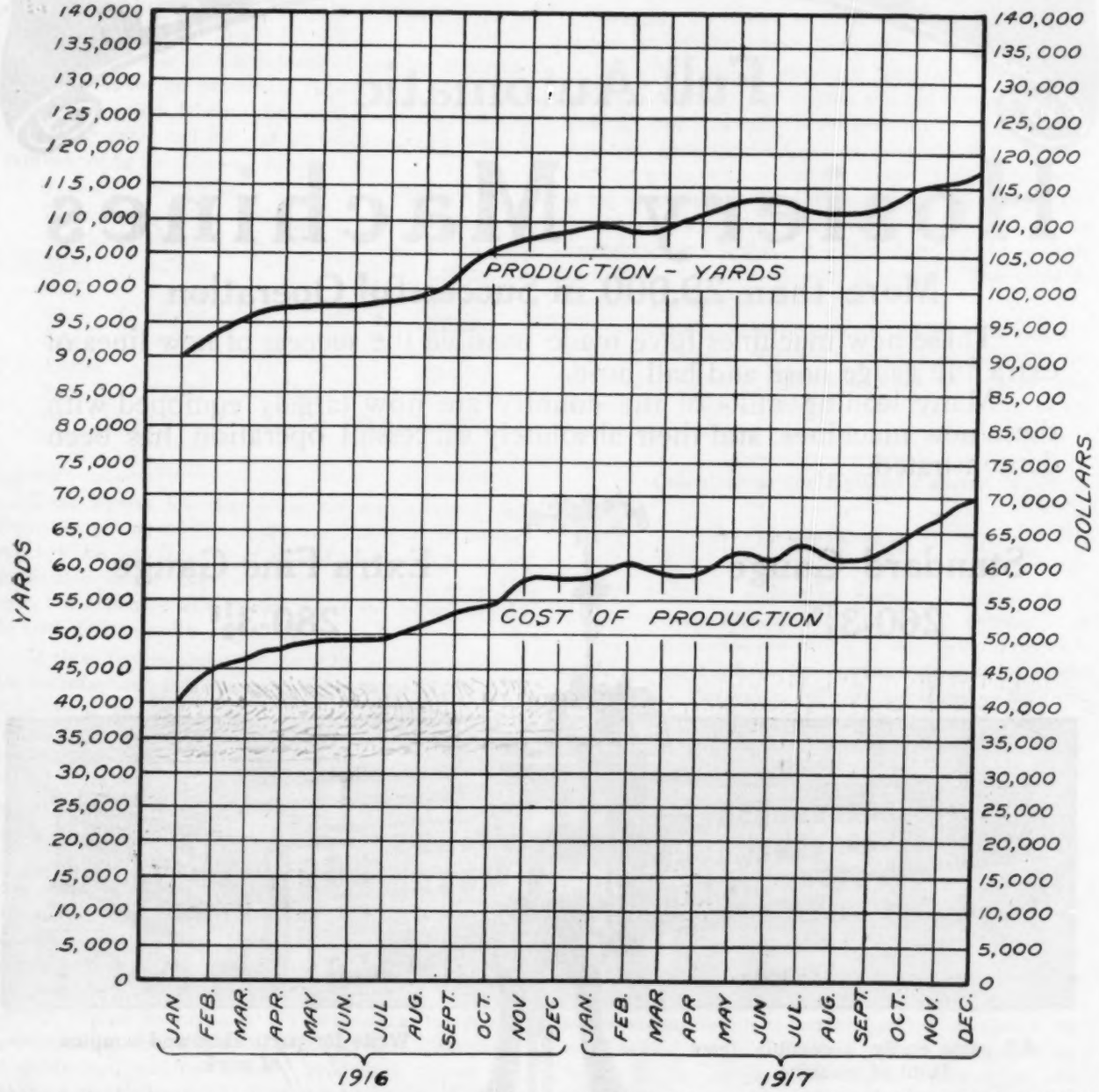

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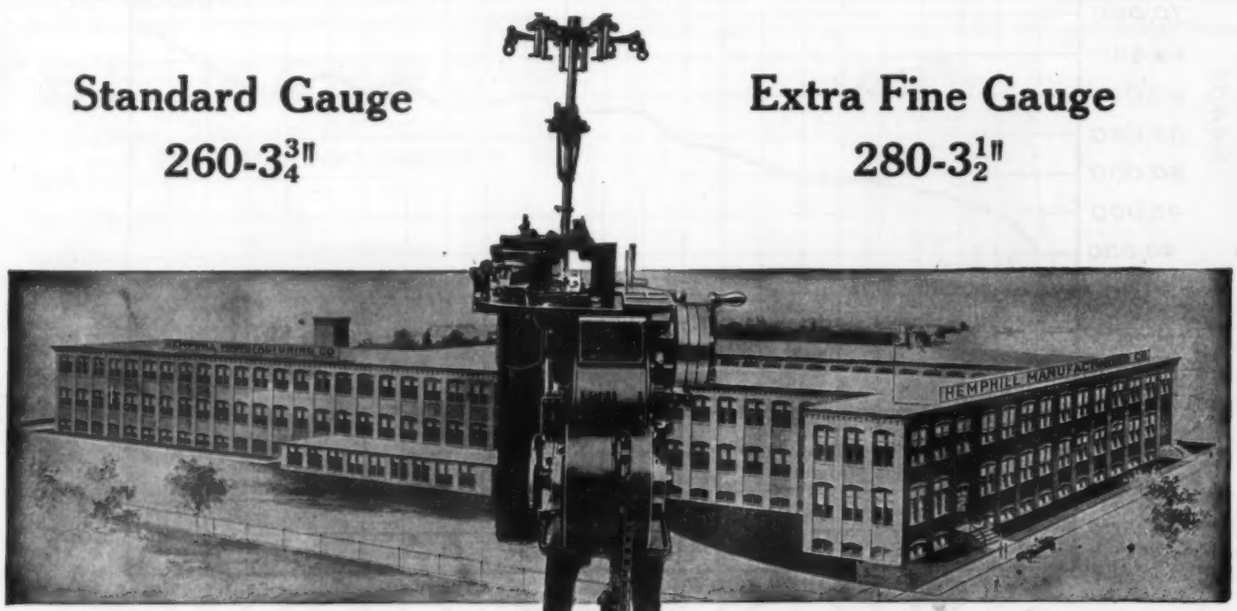

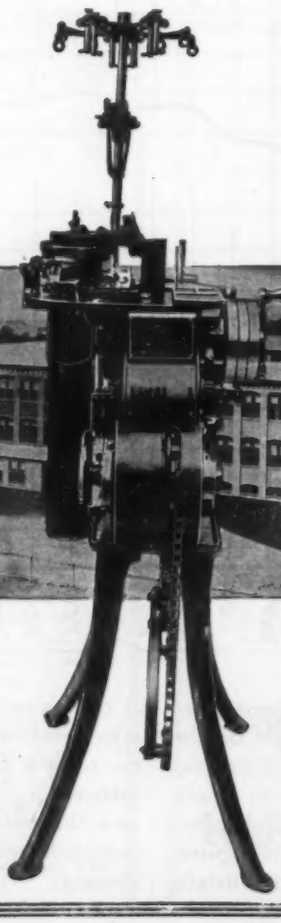

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its inception can be recorded on one chart, and such a presentation should prove to be of absorbing interest to the manufacturer who aims to exceed past performances. But the graph is not only useful to show past and present performances. It is also to be used in making plans for the future. By taking into account the increased production which has been maintained for a certain period it is possible to estimate the maximum production to which such an increase will lead until the greatest productive capacity of the plant has been reached. Thus it is possible to foretell at what time it will be necessary to increase the plant and install new machinery to handle a larger volume of business.

As an example of the methods of graphic illustration we will consider the production figures given by a manufacturer of cotton fabrics. During the year 1916 his production in yards and the cost of producing this fabric is represented by the following figures:

January	90,000 yards	$4,008.18
February	94,091	4,496.85
March	96,072	4,710.12
April	97,002	4,901.98
May	97,129	4,984.44
June	97,154	4,978.16
July	98,323	4,964.19
August	99,067	5,167.67
Sept.	102,543	5,280.75
Oct.	106,007	5,408.11
Nov.	107,662	5,906.47
Dec.	108,121	5,885.55

These figures are charted on the graph shown, and from this picture of figures the manufacturer can readily see how his production varied, and whether the cost of production varied accordingly. If it did not, as is the case, the reasons should be ascertained and efforts should be made to standardize such costs.

If these figures shown represent the entire business of the manufacturer, then the graph could be made still more effective if he were to chart thereon the gross and net profits for each period under consideration. He would then have in one picture a complete presentation of the results for the year. If placed side by side with the charts of preceding years he could readily see increases and decreases in the different groups of figures.

The making of the graph is not a difficult task. First it is necessary to have the data that is to be charted, and which should be plotted so that it will be shown in the desired manner. Then the lines of the graph must be drawn, in this case one-fourth of an inch apart, making four spaces to the inch. By referring to the figures placed at the left side of the graph it will be seen that each small space, reading vertically, is made to represent 5,000 yards of production, and the monthly production figures are chartered on this basis. To show the January production, 90,000 yards, a dot is placed on the vertical line representing January, and also on the horizontal line representing 90,000 yards.

The February production, 94,091 yards, is shown by a dot on the vertical line representing February, and also at the proper place between the horizontal lines representing 90,000 and 95,000 yards. In this manner a dot is placed in its proper position for each month under consideration, and after all the dots have been placed they should be connected by a line from dot to dot across the graph.

The cost of production is charted according to the basis established by the figures at the right hand side of the chart. Each one-fourth inch space, reading vertically, is used to represent $500. The January cost of production, $4,008.18, is shown by a dot on the vertical line representing January, and also at the proper place between the horizontal lines representing $4,000 and $4,500. The dots for each month are thus placed in their proper positions and a connecting line drawn as previously explained. All the figures having been shown, the graph is then complete.

The graph can be plotted to meet any requirements, can be made to any size desired, and can be used to represent any data. Should the production of a mill be larger than the highest figures shown on this chart, then one space could be made to represent ten or twenty thousand yards, as the case might be; or the graph could be enlarged and the same basis retained. Any length of time can also be represented on a graph. It will be noted on the one here illustrated a time of two years is charted. This could be enlarged to any number of years.

Percentages can also be shown in the same manner, and it is very advisable at times to use a graph showing the percentage figures in connection with the one as here shown. By using the percentage basis the variations become more prominent.

Calculations for Knitted Fabrics.

BY WILLIAM DAVIS, M. A.

WEIGHT PER YARD.

In connection with the trade in knitted webbing, it is customary to indicate the weight in ounces per yard of a certain finished width similar to what is done in the woven fabric trade. The weight per yard mentioned in the foregoing calculations is as a general rule that which exists on the machine, but in the weight per yard as understood by a buyer, it is the weight in the finished state. Given a certain fabric finished, the weight per yard can be calculated directly by weighing a piece on the scales, and by proportion calculating the ounces per yard. In the case of the knitted fabric it is rather difficult to cut the pattern exact to size without the use of some sort of template. These are made in suitable areas 1, 2 or 3 inches square, and have a sharp knife edge which is placed on the fabric to cut out to the size mentioned. To give the weight per yard, tables are available which give the weight at a glance, but the manufacturer should be able to perform such a calculation for himself in case the full information is not obtainable from a table. In fact he should be able to construct his own table for future use and to effect a saving of time.

If a yard of the fabric is available, then the calculation is a simple one for it consists in weighing the piece with ounce weights and noting the result. It seldom happens that such a length is obtainable and the more general problem is to find the weight from a sample which is rather miniature. With small patterns it is usual to employ grains and fractions thereof, there being 7000 grains in a pound of 16 ounces. Dram weights may also be used and their

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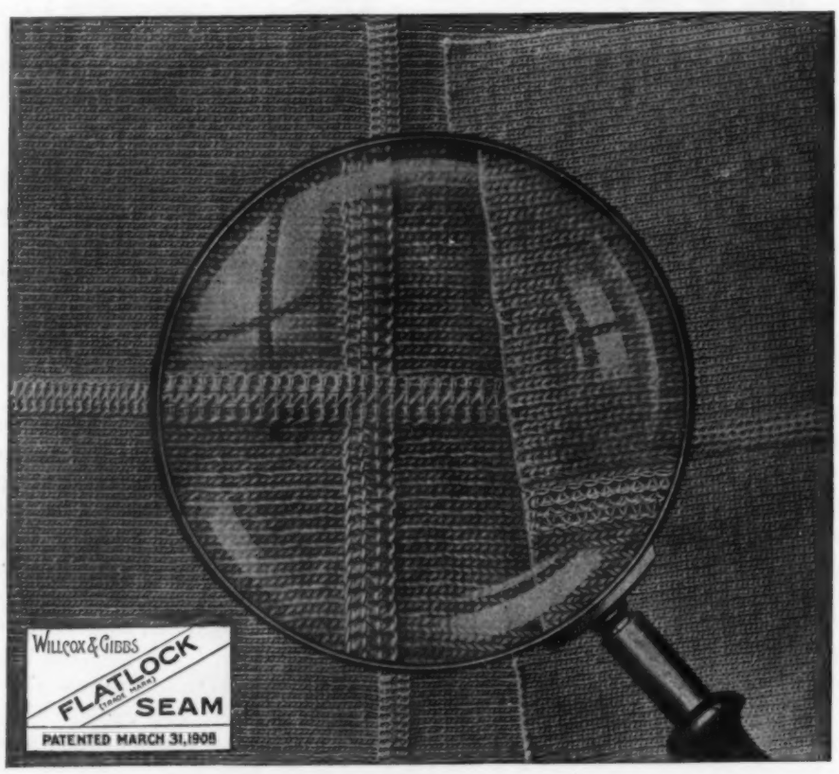

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fractions, but the grains allow of a more accurate result being calculated.

Example 15. A piece of finished knitted fabric is cut with a template 2 inches square and this is found to weigh 6.9 grains. Find the ounces per yard, 56 inches wide and 36 inches long.

The area of the piece is given by the length multiplied by the width, namely 2 inches by 2 inches = 4 square inches. The area of the yard is given by 56 times 36. The first area is stated to weigh 6.9 grains, and the weight of the enlarged area is found by simple proportion. $2 \times 2 : 56 \times 36 ::$ 6.9 grains : the answer.

This will give the answer in grains but it is required in ounces. There are 7000 grains in 1 pound of 16 ounces so that to divide by 7000 will give the answer in pounds, which to bring to ounces is multiplied by 16. The full formula is given thus:

$$\frac{56 \times 36 \times 6.9 \times 16}{7000 \times 2 \times 2} = 8 \text{ ozs. per yard (approximately).}$$

THE CONSTANT.

This is a notable case where the constant should prove of the greatest service either in devising a table which can be used in all similar calculations or for use when such items are required. For the constant let the figures most likely to recur be pointed out. These would be the length 36 inches, the width 56 inches, 16 for the ounces and 7000 for the grains. When these are removed from the formula it will be seen that the only items remaining are the weight, 6.9 grains on the top of the line, and the area of the piece, 2×2 on the under part of the line. These are termed the variants because they will be different with every new pattern tested.

Let the constant be found for an area of a piece of fabric 1 inch wide by 1 inch long, this when multiplied together gives 1 square inch, which will prove a suitable starting point for the construction of a table for various constants.

The factors remaining in the formula are:

$$\frac{56 \times 36 \times 16}{7000} = 4.61$$

which is the constant for all fabrics 56 inches wide, 36 inches long cut to a template of 1 inch by 1 inch = 1 square inch. To obtain the ounces per yard all we have to do is to multiply the weight in grains by 4.61, for it will be seen that in the formula the weight in grains is all that is left on the top of the line. The following examples will demonstrate the great advantage of a constant such as this.

Example 1. Find the ounces per yard of a knitted fabric where a template of 1 inch by 1 inch weighs 1.63 grains. a yard is 36 inches long and 56 inches wide. The constant is 4.61 and the ounces per yard is obtained at once by multiplying this by the weight in grains thus: $4.61 \times 1.63 = 7.51$ ounces per yard.

Example 2. Find the ounces per yard of a fabric 36 by 56 inches, if a square inch weighs 3.1 grains, 4.61 times $3.1 = 14.3$ ounces per yard.

Finding the weights of the template shows 2.65 grains and 1.93 grains respectfully. 4.61 times $2.65 = 12.2$ ounces per yard. 4.61 times $1.93 = 8.9$ ounces per yard.

There is a very good reason for having the size of the small pattern constant which is that the stamp or template can always be kept the same and only one requires to be stocked. Larger templates may be used but it will be found that the smaller the template the better chance one has of making it suitable for the pattern in hand. When the traveler or agent comes home with a pattern of a novelty it is generally diminutive indeed, for he has often obtained it in circumstances which make it impossible to secure a larger portion. Larger portions can be cut out by measurement with the ruler and marking off with pencil but it must be stated that for knitted fabrics this is not to be recommended. It is very difficult to make the cutting sharp enough and the final result is thereby vitiated. In the woven cloth the run of the warp and weft threads often act as fairly reliable guides in cutting a given dimension but these guides are not so reliable in the case of the knitted fabric where the entire structure is built from one thread.

These examples of the use of a constant demonstrate that what is in itself a difficult calculation to the uninitiated may be made very simple and thereby greater accuracy is gained. By working the longer method mistakes are easily made which may lead to unpleasant results. It may be useful in this connection to have a short table which will give the approximate results for the template of 1 square inch of fabric, 36 inches long and 56 inches wide. This can be usefully done in graduations of a quarter grain and by working it out for weights up to about 18 ounces per yard we have all that would be likely to occur in practice. The weight per yard calculated when 1 square inch = 1 grain was 4.61 ozs. and for the half grain the weight will be 2.30 ozs. per yard, for the quarter grain it will be 1.15 ozs. per yard, in proportion. With these it is an easy matter to construct the following table:

Weight of One Square Inch.	Ozs. per Yard (56×36)
.25 grain = ...	1.15 ozs. per yard.
.50 grain = ...	2.30 ozs. per yard.
.75 grain = ...	3.45 ozs. per yard.
1.00 grain = ...	4.61 ozs. per yard.
1.25 grain = ...	5.76 ozs. per yard.
1.50 grain = ...	6.91 ozs. per yard.
1.75 grain = ...	8.06 ozs. per yard.
2.00 grain = ...	9.22 ozs. per yard.
2.25 grain = ...	10.37 ozs. per yard.
2.50 grain = ...	11.52 ozs. per yard.
2.75 grain = ...	12.67 ozs. per yard.
3.00 grain = ...	13.83 ozs. per yard.
3.25 grain = ...	14.98 ozs. per yard.
3.50 grain = ...	16.13 ozs. per yard.
3.75 grain = ...	17.28 ozs. per yard.
4.00 grain = ...	18.44 ozs. per yard.

THE DIMENSIONS.

The length of the yard generally remains at 36 inches except in certain districts where the custom has arisen of giving the length 37 inches to the yard. This had its origin in the usage of measuring cloth by pulling it over by hand and placing it against a measure improvised at the edge of the table. In drawing the cloth from one yard to the next a certain length was taken up by the thumb in holding it and what was first regarded as an allowance to the buyer, later came to be claimed as a right. There has been of late

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The characteristics of a knitting machine, like those of an individual, are determined by its origin and history; just as knowledge of the individual's family, schooling, and early life are desirable for the formation of an idea of his characteristics, so knowledge of the plant, personnel and ideals involved in the construction of the knitting machine are necessary for an understanding of its merits. Investigate the origin of our knitting machinery.

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a revulsion of feeling against such archaic systems of trading and the former standard of length is re-asserting itself. One of the greatest difficulties to the calculator lies in the fact that if the length of the yard is increased to 37 inches, a very awkward prime number is introduced into the formula which confronts one at every turn rendering cancellation into any other number almost impossible. Similarly in certain districts the width in place of being regarded as a constant is increased in the case of narrow widths from 28 to 29 inches, and for the double width from 56 to 58 inches wide. In both cases we have the very awkward prime number of 29 involved which is exceedingly difficult to manipulate with other factors in a calculation. In the case of the knitted fabric the width does not allow itself to be so much of a standard as is possible in the weaving branch. In the latter section of the textile industry the looms are built more or less to a standard width either the narrow width to give 28 inches wide finished cloth as is often the case in the cotton industry, or the looms are known as double width machines where they are built to produce a width which will give 56 to 58 inches wide finished. In the knitting industry it is not possible to standardize widths in the same way because of the large variety of machines used in manufacture. As a rule the machines on which long lengths of webbing are worked are circular in form and the diameter of this circle varies considerably. A very common diameter of machine is that which gives when finished a circle of webbing 30 to 38 inches in width which can either be used in circular form for the bodies of articles such as shirts and nightdresses or the circle may be cut along the edge to give a straight piece of plain fabric which can be carved into any form of garment desired.

The calculator of particulars of knit goods therefore has to recognize a certain variation in regard to the width of the cloth and whilst a table of standard width of 56 inches may be very useful, still he requires to know how to adapt this table for any width of knitted fabric which may be the requirement of the market at the particular moment. It sometimes happens that fashion has a voice in the matter and that to produce a given article of popular demand a fabric of excessive width is required which proves a tax on the capacity of the existing plant. It was thus in the boom for the plain stitch knitted coats a few seasons ago, the ideal machine to work them proved to be the Cotton's patent frame, which, as is known, is seldom built wider than 32 inches to the division. Fortunately the adaptation of the table for any width desired at the moment is not a matter of great difficulty. If the width is varied the weight per yard varies to a corresponding degree; it is a case of simple, direct variation. The same may be said of a variation of the length of the yard, if it is increased to 37 inches, then the weight per yard would be augmented by the addition of 1/36. Similarly if the weight per yard for a width of 56 inches is given as 14 ozs., then the weight per yard corresponding to a width of 60 inches would be given by adding 4/56 = 1/14 to the weight per yard which would bring the weight to 14 + 1 = 15 ozs.

In this connection the following table may be of service. It is drawn out in widths from 40 inches to 60 inches wide with steps of 2 inches difference between the one stage and the next. The area taken is 1 square inch and the calculations are made to give the weight per yard to two decimal places for a range of fabrics where the weights of one square inch increase by .25 grains till 4 grains are reached. The use of this table will obviate the necessity of a constant, or of making any calculation whatsoever. Some modification may be necessary in the case of patterns which come out between the .25 grain step but this would be very slight and could be rapidly performed by an examination of the values above and below that required and estimating the mean. The foundation of the table is to be found in the series of values which appear opposite the weight of 1 grain and which were calculated out fully by the ordinary method of calculation as demonstrated earlier in this article, all the other values are the result of direct computation from the 1 grain weight.

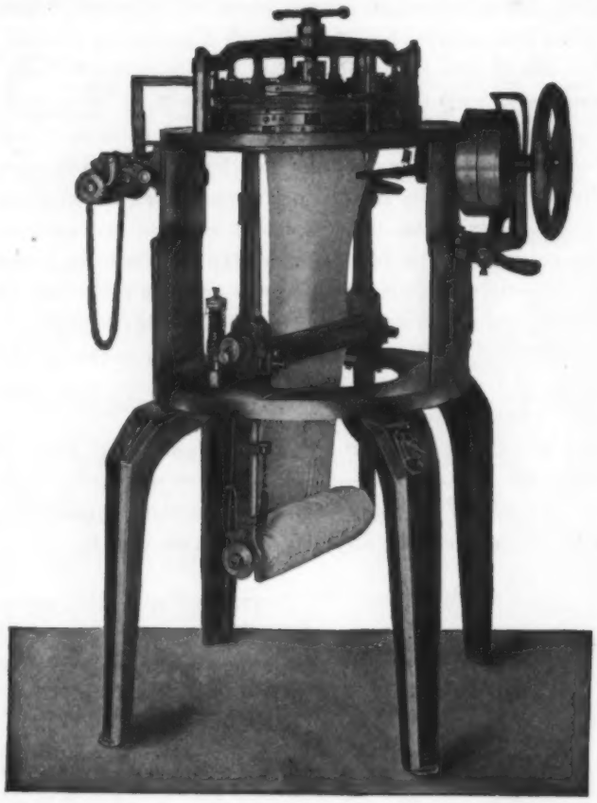
Table for showing at a glance the weight per yard, 36 inches long for a variety of widths from 40 to 60 inches wide.

The size of the piece is in every case one square inch; the weights are given in grains, 7,000 grains per lb.

Weights of 1 sq. inch—Grains.	WIDTHS										
	40	42	44	46	48	50	52	54	56	58	60
	Ounces Per Yard.										
.25	.82	.86	.90	.94	.99	1.02	1.07	1.11	1.15	1.19	1.23
.50	1.65	1.73	1.81	1.89	1.98	2.05	2.14	2.22	2.30	2.38	2.47
.75	2.46	2.60	2.72	2.83	2.94	3.08	3.21	3.33	3.45	3.55	3.70
1.00	3.28	3.46	3.62	3.78	3.95	4.11	4.28	4.44	4.61	4.77	4.94
1.25	4.11	4.32	4.50	4.72	4.94	5.13	5.35	5.55	5.76	5.96	6.17
1.50	4.93	5.19	5.43	5.67	5.88	6.16	6.42	6.66	6.91	7.15	7.41
1.75	5.75	6.06	6.34	6.61	6.89	7.19	7.49	7.77	8.06	8.32	8.64
2.00	6.58	6.92	7.24	7.56	7.90	8.22	8.56	8.88	9.22	9.54	9.88
2.25	7.40	7.78	8.14	8.50	8.89	9.24	9.63	9.99	10.32	10.63	11.11
2.50	8.23	8.65	9.05	9.45	9.88	10.27	10.70	11.10	11.52	11.92	12.35
2.75	9.04	9.52	9.96	10.39	10.84	11.30	11.77	12.21	12.67	13.09	13.58
3.00	9.87	10.38	10.86	11.34	11.75	12.33	12.84	13.32	13.83	14.31	14.82
3.25	10.69	11.24	11.76	12.28	12.74	13.35	13.91	14.43	14.98	15.50	16.06
3.50	11.52	12.11	12.67	13.23	13.73	14.38	14.98	15.54	16.13	16.69	17.29
3.75	12.33	12.98	13.58	14.17	14.69	15.41	16.05	16.65	17.28	17.86	18.52
4.00	13.56	13.84	14.48	15.12	15.80	16.44	17.12	17.76	18.44	19.08	19.66

Examples of the use of the table. (1) Find the weight per yard (36 x 42) of a knitted fabric of which a template of 1 square inch weighs 2 grains. Referring to above table on the line marked 2 grains we find the weight per yard given under the column for 42 inch widths which is 6.92 ozs. per yard. (2) Find the weight per yard of a knitted fabric one square inch in area of which weighs 2.5 grains, the width is 52 inches. Referring to the line marked 2.50 grains we find the weight per yard in the column for 52 inches of width = 10.7 ozs. per yard. Find the weight of the latter sample if the width is increased to 60 inches. This is found on the same line under the column marked 60 = 12.35 ozs. (3) Give the weight per yard 36 x 48 of a knitted fabric one square inch of which is found to weigh 1.75 grains, and of another of the same width which weighs 2.75 grains per square inch. The first = 1.75 grains and the weight will be found on the line marked thus and under the column marked 48 inches = 6.89 ozs. per yard. For the second the weight is 2.75 = 10.84 ozs. per yard.

Of course the weights found do not always appear as direct fractions of a grain and in such cases the reader will require to strike a mean between the lower and the higher value.



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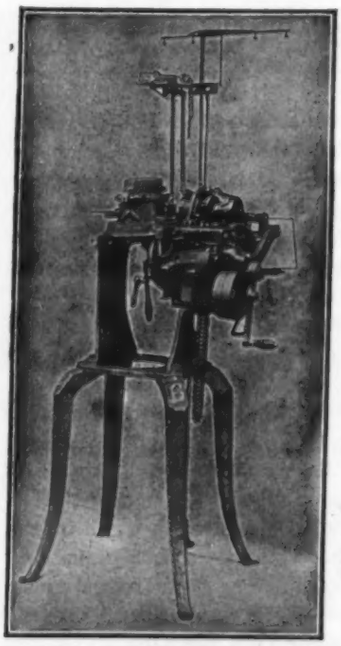

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AND
All hosiery mills **WOULD BUY** our machines.

Write for our FREE TRIAL—SPECIAL PRICE—and SPECIAL TERMS—OFFER to mills that have none of our machinery in use.

Example 4. Find the weight per yard 36 x 54 of a knitted fabric one square inch of which weighs 1.85 grains.

Looking in the column for width 54 inches we have a weight of 1.75 grains giving 7.77 ozs. per yard, whilst the next value of 2 gives 8.88 ozs. The new figure can be obtained exactly thus: 8.88 minus 7.77 = 1.11 ozs. for a difference of .25 grains, find by proportion the difference = 2.00 minus 1.85 = .15 grains. The proportion is then stated thus: If a difference of .25 in the weight gives a difference of 1.11 ozs. per yard, find the ozs. for a difference of .15. .25 : .15 :: 1.11 : the answer.

$$\frac{.15 \quad 1.11}{.25} = .66 \text{ ozs.}$$

This added to 7.77 = 7.77 + .66 = 8.43 ozs. per yard.

The proceeding may be voted rather lengthy and as a general rule the operator may prefer to make a well directed guess at the mean which in most cases will be quite near enough for practical purposes. Perhaps if the widths customary in the trade of any particular factory are confined to a few standards which will be the case if only a few diameters of machines are in use, then it may be advisable to dispense with a number of widths shown in the table and introduce a greater degree of accuracy in regard to the weight or grain column. This is specially desirable if it is required to use the table for testing the weight per yard of a knitted fabric. The fabric is delivered at a certain weight per yard and it is desired to find out whether the sample is up to the specification, a consultation of the table would show three things: (1) It would indicate whether the weight were correct. (2) It would show how much the weight was to the light side. (3) It would show by how much the fabric was to the heavy side.

Example 5. A knitted fabric 36 x 56 is ordered to be 11½ ozs. per yard, find the actual weight per yard if it is found that one square inch weighs 2.25 grains. Looking along the horizontal column under the width of 56 inches we find that the weight per yard is 10.32 ozs. so that the fabric is rather light. Although it might not be a serious difference, still it is a useful piece of information to possess. There is a strong conviction amongst practical men that if these differences were entirely a matter of chance, the difference should appear on the heavy side more often than is the case.

Example 6. A knitted fabric 48 inches wide is required to be 5 ozs. per yard, but on weighing the square inch it is found to show a weight of 1.38 grains find the actual weight. On consulting the table under the width 48 inches the weight will be half way between 4.94 and 5.88. 5.88 minus 4.94 = .94 ozs.; half of this gives .47 ozs. to be added to 4.94 = 5.41 ozs. exactly. In this case the weight is about half an ounce to the heavy side.

The subject of the weight per yard has been dealt with on the basis of the smallest possible area which can be weighed with any chance of satisfactory results and this can also be applied in principle to cases where it is found that a larger template can be used and larger pieces of fabric taken to make the test of the weight per yard. If the template is larger it is probable that the system of drams and ozs. will be found most suitable. The template may be 2 inches square which will give an area of 4 square inches, it may be 3 inches square which would give an area of 9 square inches, also intermediate fractions might be selected if necessary. Sometimes templates are used which vary in their dimensions of width and length such as 2 inches wide by 3 inches long giving an area of 6 square inches, 4 inches wide by 5 inches long which would give an area of 20 square inches. More often the pattern is greater in the width than the length owing to the way in which it is customary to submit patterns in sample cards and texture books. In calculating the weight per yard from a sample such as this one point is often overlooked with rather disappointing results. Before a calculation can be accurately effected from a pattern which is not exactly square in dimension, it should be ascertained that the fabric is exactly a "square" one. This term is best known in the weaving trade and is most often used there; it is in reference to the warp and weft particulars in a cloth, which is said to be "square" if the number of ends per inch in the warp is the same as the number of picks of filling, provided also that the counts of yarn in the warp is the same as the counts of filling. In a case such as this it is quite permissible to cut the pattern unequal in dimension in length and breadth, say 5 by 3 or 3 by 2. If, however, the pattern has not the same number of ends as picks and the counts of warp and filling vary, then it is clear that to estimate the ozs. per yard we should have a piece which is exactly square. If, for instance, a pattern with the warp heavier in proportion to the weft were cut to a template of 3 inches wide to 2 inches long, then the total weight of the sample would have an increase proportionately in the weight of the warp as against the weight of weft, a matter which could assuredly be put right by making a calculation, but the details necessary for this might not be readily available by the operator. To extend the analogy to the case of the knitted fabric, this has, as a rule, more courses per inch in the length than there are stitches in the width, in fact the exact conditions which hold in the case of even a plain stitch knitted fabric have not yet been fully investigated.

Further if the warp has a striped effect such as is required for clocking, then it is absolutely essential to an accurate result that the pattern should be cut square and that the width chosen should include an exact number of repeats of the patterning threads. If, for example, the stripes were half an inch apart, the pattern in the case of an inch template should be cut so as to show two repeats of the stripe. It would be an easy matter in this instance, but if the pattern did not come out to the width of the template, the dimensions of the sample cut would require to be altered so as to give an exact number of repeats of the pattern. There might be for example a heavy chenille yarn appearing every few inches and whose weight would require to be shown and accuracy would necessitate the cutting of a sample large enough to include the entire pattern, exactly square. It will be evident that the latter requirement will render inaccurate the custom of measuring weight on a yard of the fabric. For example the width may be 56 inches and if sufficient length were available the most direct course would be to weigh a length of 36 inches cut direct from the finished cloth. Now as the length and width vary, it follows that the warp factors will appear in greater proportion than those of the weft and if the former are relatively heavier than those of the weft, the weight will come out heavier than if the fabric is measured on the square.

(To be continued.)

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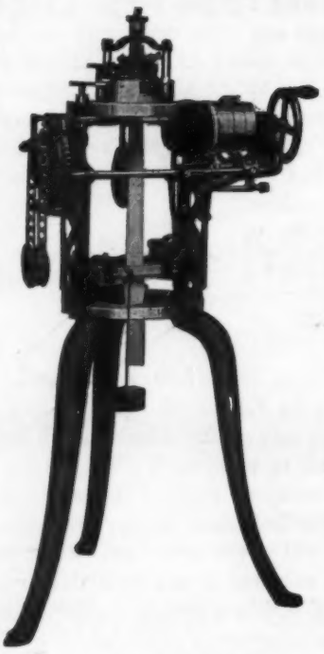

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Service and Satisfaction.

The accompanying illustration shows the exhibit and service station of the Pennebaker-Turley Company of Chattanooga, Tenn., at the Annual Convention and Exhibition of the National Association of Hosiery and Underwear Manufacturers in Philadelphia. This company began business on January 7th, 1909, and about one year later they began the exclusive manufacture of bands, labels, rider tickets, box tops, etc., for the knit goods trade. They are now supplying a total of over 1,500 wholesalers, jobbers, knitting mills, and retail dealers with these and similar products.

Their list of customers not only covers the United States and Canada, but includes Mexico, Cuba, Central and South America, Australia and several European countries. Not only do they perform excellent printing, lithographing and embossing, but their principle product to customers is service and satisfaction. They claim they can reach any knitting mill within the original Mason and Dixon Lines within eighteen hours' time, effecting a saving in freight, express and parcel post rates as well as considerable time. The entire plant of the company is devoted to the manufacture of the articles outlined, and the force of employees maintained are especially educated and trained in the operation of a specialty business of this character. One unique feature about this training of operatives is shown by the fact that all the employees of this company at the present time have been with this firm from its beginning, with the exception of one employee, and in this exceptional case, the employee is now in his second year.

O. F. Pennebaker of the firm, spent about 35 years with large printing establishments and is personally in charge of the detail work of the organization. W. V. Turley, the business manager, is president of the Union Bank and Trust Co., and also president of the Albert Amusement Co. R. T. Edwards, the Eastern representative of the company, makes his headquarters at 320 Broadway, New York City.

With huge army contracts staring them in the face, the textile manufacturers of the country do well to ponder how best they may "do their bit" for the nation. They can best serve if they but see to it that every phase in the production of their goods represents the last word in efficiency and service. They can be certain that many important details in their shops are "doing their bit" if they use the splendid line of textile manufacturing staples made especially for them by The Arabol Mfg. Co., 100 William Street, New York City. Successful textile manufacturers know by experience that Arabol products render the service they want.

The Knit Goods Market.

Runaway prices for supplies and speculation as to the full effect of the Federal Child Labor Act are the disturbing factors in the knit goods market, which is considerably unsettled, with the ultimate cost of production for next season left to conjecture.

Hosiery and underwear manufacturers are not a little puzzled by the varying attitude of Philadelphia yarn merchants—some predicting a moderate decline in prices, to be followed by a return to at least present figures and perhaps higher. Others affect to believe there will be no recession. Meanwhile speculative buying of yarns in the Philadelphia market is wholly suspended, and the disposition of manufacturers generally is to buy only for immediate wants and to sell only so far as they are covered for materials.

Thus far manufacturers are able to protect themselves fairly well, but there is a most important commodity the cost of which cannot be reckoned more than a few weeks in advance; that is labor, and it is giving mills in the Philadelphia territory no little concern, demands for increases being of almost daily occurrence, and help, to a great extent, being wholly indifferent whether machinery be kept in operation to capacity.

Among hosiery manufacturers the uppermost question is that relating to the opening for spring. Some few manufacturers began selling several weeks ago and are taking all the business desired. Others will not open before September, and not a few contemplate selling for spot delivery only until October 1. The Rome (Ga.) Hosiery Mills opened about the middle of July and took orders in satisfactory quantity at prices somewhat above those which a few other mills had quoted. John M. Berry of Rome spent some time in New York in connection with the commencement of the spring 1918 business.

A representative of the Knoxville (Tenn.) Knitting Mills Company says his company will go out in early August with spring lines. For the Elizabeth City (N. C.) Hosiery Company, P. H. Williams says prices for spring will not be named until September 1 at the earliest. Among the mills which have been selling for next season is that of E. Sutro & Son Company, Philadelphia.

Full fashioned silk hosiery continues scarce, and there is a call for an all-thread silk mock fashion to sell around $7 to $10. This is a demand that will be difficult to meet if prices of hosiery silk remain where they are. When the price crossed $7 a pound some days ago manufacturers were inclined to throw up their hands, as they did when a month or two before they heard $6 quoted for the first time. A Pennsylvania manufacturer is getting $4.25 a dozen for 12-thread silk half hose.

With artificial silk, 150 deniers A quality, selling around $4.30 a pound and contract prices not to be named for a month or more, it is apparent that Japan easily is in control of the world silk situation. Some large interests are looking for $10 silk before the year closes. This is even more startling than the prediction by some worsted spinners that within eight weeks quarter blood worsted yarns will sell themselves at $1.90 a pound, and perhaps $2.

Clearly the outlook is for higher prices for textiles, knitted and woven, that will go to the consumer next spring and summer, and it need not be surprising if some of the hosiery and underwear manufacturers selling for spring wake up to the fact that they priced their goods too low. Much of the pricing has been based on present labor costs, it being assumed that mills covered for materials. The prices of some low end hosiery are believed in some quarters to have been made by several mills preparing to discontinue the lines.

It develops that some manufacturers have overlooked a lot of the "little things" the cost of which must be considered in selling knit goods yet to be manufactured. A large mill which last year bought a carload of nails at $1.80 per keg now is paying $4.20. Packing cases have been costing 25 per cent less and paper boxes $6 to $9 per 1,000 less than what will be paid for those into which merchandise for spring will be packed. The mill broom has advanced 100 per cent, and repairs and materials for repairs anywhere from 25 to 100 per cent. A manufacturer who had been paying $1.90 a ton for coal will send to his customers next season hosiery in the manufacture of which the coal cost was $4 per ton.

All considered, prices are believed by many persons in the knitting industry to be low in contrast to what they will be some months hence. The 50 cent mercerized stocking for women is dangerously near being crowded off the boards. Two ply 70's mercerized yarn was offered several days ago at $1.45-$1.85 a pound, dependent on grade and mill mark, but not taken. The seller was not sufficiently eager to sell to name a lower price, although only a few days before, combed Egyptian 2-ply 80's in skeins was sold at $1.85. Because of the high prices for mercerized, some hosiery manufacturers are considering the more extensive use of lisle, in order to continue putting on the market a fairly good stocking to retail at 50 cents. It will be seen that dealers have yet to get away from the fixed or popular price, and the manufacturers are trying to accommodate them.

While the knit goods market is strong and fundamentally sound, hosiery is likely to strike some snags, judging from the buying during the underwear opening in July as in contrast with the transaction when samples were brought out seven months ago for next fall's lines. Then buyers took underwear as though mad; today they are operating as if afraid.

Not over 50 per cent of the buyers were sufficiently interested to visit New York for the opening in July, according to leading agents. True, some of the large mills, making established lines booked good business, particularly in the better grades. In the low end goods probably not 60 per cent of normal quantities were taken. Some few mills sold up as far as they were willing to go. One large establishment handling the output of a number of mills reports sales of about 75 per cent, measured in dozens, of its customers' usual requirements. This house, however, opened some days in advance of what is known as the balbriggan group of mills.

Measured by the underwear opening, there is going to be no great rush for hosiery when once all mills are selling for spring. There promises to be steady but not eager buying. Jobbers will not miss an opportunity for hammering prices, which they feel are too high for good retail business next year. Those who are deferring their spring purchases are likely to pay more than they are willing to

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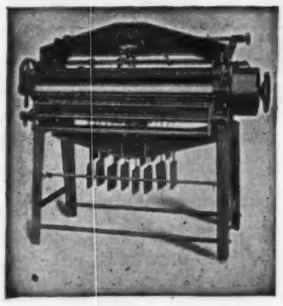

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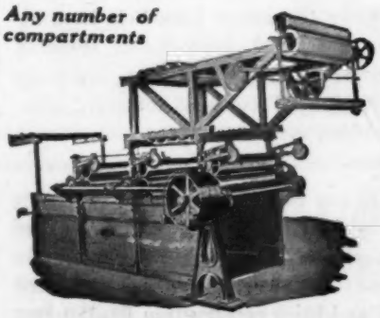

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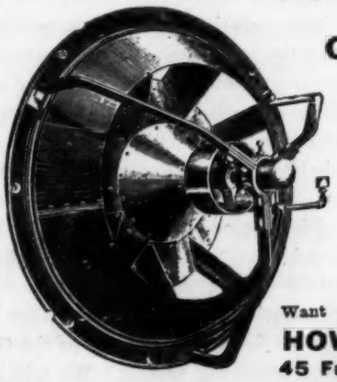

have been designed to produce any pressure required in any plenum or exhaust system, the disc fan not being effective in many such installations.

Duplex Cone Fans are preferable to the commonly used centrifugal or enclosed blower fans, because of the small space required, and also the small initial and power maintenance cost.

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offer now. It will require confidence and firmness on the part of manufacturers to maintain a proper price level.

Some of the weaker mills will yield to the arguments of buyers, and this may cause something of a price disturbance, but these mills may be expected, as the market advances, to do what a great many have been doing the past six months or more—disappoint their customers in the matter of deliveries. Even now some few mills which have not delivered what they sold and say they cannot deliver, are offering merchandise for December-January delivery at the new prices. But they are circulating among buyers who were not on their list last year; and they have yet to reckon with a new and untried labor law which threatens disaster to textile industrial lines.

Manufacturers generally are being notified by their customers that beginning August 1 they will require a guaranty that merchandise invoiced to them was manufactured in compliance with the provisions of the Federal Child Labor Law, and already many mills are affixing the guaranty to order acceptances and bills. This is thought to be necessary in view of the fact that much of the merchandise going out from mills now may not leave the hands of jobbers until well after the new law has gone into effect.

A very nice question has been raised by a Philadelphia manufacturer. During August he may employ juveniles under the provisions of the laws of the state in which he operates. As these same juveniles come within the provisions of the Federal law, the fact that they were employed in August, before the Federal law had gone into effect, might prevent the manufacturer shipping in interstate commerce in September any goods in the production of which these juveniles had been engaged, as at least 30 days must have elapsed between the manufacture of such goods and their delivery for shipment.

One way to get around the 30 days provision would be to make no shipments in September of anything manufactured in August. The merchant nevertheless would be justified in demanding the guaranty, under which he could not be prosecuted even though the goods had been manufactured in violation of the law. It will be up to the manufacturer to fully protect the distributor.

The provision of the law which authorizes a Federal District Attorney to institute proceedings against an employer for violation of the law upon evidence furnished by "any person" makes it necessary for employers to adhere very closely to the strict letter of the law. "Any person" includes the disgruntled employee, who will be egged on by the professional labor agitator.

Pending an official interpretation of the law and the promulgation of accepted rules and regulations for carrying it into effect, hosiery manufacturers, who are extensive employers of juvenile labor, are disposed to operate with unusual caution, in which they are further influenced by market conditions. Probably the best advice on the subject of careful merchandising in the months to come was given at a recent conference of knit goods manufacturers by the executive of a large Broadway (New York) house selling the output of an important eastern mill. "Our plan," he said, "is to sell but three months' production; then take the goods off the counter and wait for another survey of the field before revising prices and resuming selling. We will sell our customers only pro rata of their season's requirements. Either we or they may profit by this plan, and vice versa, but neither will be badly hurt, regardless of the ups or downs in the market. We do not want the jobber to be hurt, and we believe the jobber does not want us to suffer."

There have been many conferences between manufacturer and jobber on this subject, and it is stated the latter are disposed to be reasonable. While market conditions are fraught with much danger, it is believed the risk is being eliminated by conservative buying. The reputable and straightforward manufacturer and jobber are operating along lines of the least danger. The mill that accepts any old kind of business and the merchant who is willing to trust his future to such a mill is liable to come to grief, and it is no wild prediction that should there come such a jolt as is possible the fields of commerce would be strewn with the corpses of producers and distributors whose greed for business submerged their judgment.

In the present state of affairs it is no wonder that sellers hesitate to quote prices for comparative purposes. When they do so they probably do not give the figures at which sales are being made. Following are some of the latest quotations available, indicating approximately the prices at which the classes of hosiery indicated are commanding:

Misses 3 pound ribbed, $1.65 on 7's and $1.85 on 8's, and $2 on 8's for January delivery.

Ladies' cotton, 20 ounce, 176 needle, $1.05 to $1.10 for sewed toe; 2½ to 5 cents additional for looped and 10 cents additional for 24 ounce.

Ladies' 220 needle cotton, 20 ounce, double carded, double sole and high spliced heel, $1.60 to $1.75 flat.

Half hose, 144 needle, 10's single, $1 to $1.10, sewed toe; 176 needle, 14's carded, $1.15 to $1.25, tan, lavender and cadet 2½ cents higher; 84 needle waste yarn, $1.15, 2/10, no freight allowance.

Infants' socks, cotton, black, bleached and colors, $1.10; mercerized, $1.45, with 5 cents additional for cuffs; mercerized fancy, $1.75, these prices apply to all sizes to 8, and 10 cents additional for larger, to 9½.

A southern mill has priced misses' hose, 28's carded, at $1.20 on 7's and names $1.20 flat for ladies' 1½ pound, patent toe, sewed, 5 cents less.

Announcement has been made to the effect that McCrossin & Darrah, American Trust Building, Birmingham, Ala., now represent the Link-Belt Company, of Chicago, in the state of Alabama. Both E. Francis McCrossin and John S. Darrah of this firm are experienced in Link-Belt engineering work, and besides aiding in rendering even better service than heretofore in this territory, this company will handle practically the entire Link-Belt line, including malleable iron and steel Link-Belts, sprocket wheels, silent chain drives, roller chain drives, elevating and conveying machinery for all kinds of material, locomotive cranes, wagon loaders, etc.

The Bound Brook Oil-less Bearing Company anticipate having their new foundry building, which is being erected at Plant No. 2, at Lincoln, N. J., two miles east of the Bound Brook plant, ready for occupancy on August 3rd. This building is of steel and brick construction 60x180 feet.

The Tape Belt For Universal Winders

We have perfected a cotton tape belt for driving Universal Winders. Also one for Cameless Winders. We urge all users of these machines to write us for samples. We offer this with our full indorsement because exhaustive tests have satisfied us of its real merit.

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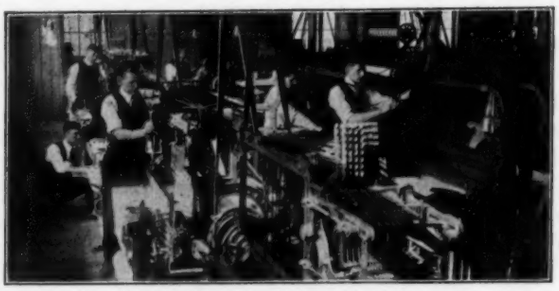

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Every Southern textile mill needs young, energetic operatives who have had thorough training—training for leadership in the textile industry.

May we suggest a little plan whereby you can accomplish this? Why not offer a course in Textile Engineering to your young men as a prize for the most efficient work, or the largest volume of work, done in a specified time? The winner sent to the Georgia School of Technology would be thoroughly trained in every process from the raw cotton to the finished fabric, and turned back to you a trained, textile graduate.

The Textile Department of the Georgia School of Technology would be glad to co-operate with all textile manufacturers in working out any plan whereby we can train more of our young Southern men for better work in the textile industry. Two courses are offered: A 4-year course leading to the degree of B. S. in T. E.; and a 2-year course leading to a certificate in T. E.

For further information address K. G. Matheson, President, Georgia School of Technology, Atlanta, Ga.

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Among the Knitting Mills.

The Oneida Mills at Oneida, Tenn., which were recently organized with a capital stock of $16,000 and equipped with 275 knitting machines are being operated on seamless hose. Garnett Andrews of Chattanooga, Tenn., is manager.

Work has begun on the Queen Knitting Mills of Statesville, N. C. Work is being pushed, and the company anticipate having the mill running at an early date.

The Gibsonville (N. C.) Hosiery Mill Co., has been organized with J. W. Burt as president. The capital stock is $14,000, and the mill will operate on 188 to 200 needle hosiery. W. N. Jones is superintendent.

The new Standard Knitting Mills, Inc., of Gastonia, N. C., will be in operation in approximately 60 days. The machinery has been ordered.

It is reported that the G. H. Y. Hosiery Mill at Concord, N. C., is to double the capacity of the plant. Roy Morrison, formerly of Ipswich, Mass., is superintendent.

A conference of Southern knitters was held at the Selwyn Hotel in Charlotte, N. C., on July 5th. The meeting was executive, nothing being given out for publication. Approximately twenty-five mills were represented.

A new hosiery mill recently organized at Lenoir, N. C., by F. T. Moore and others, is progressing rapidly. Machinery is being installed and the plant will probably be started within the next thirty days.

The construction of the building for the Asheboro Cotton Mills at Asheboro, N. C., which was reported some time ago, is progressing rapidly, and is practically ready for the installation of machinery. The additional equipment will be 30 knitting machines and dyeing and finishing machinery. It is locally reported that as soon as the knitting mill is well under way cotton spinning and weaving machinery is to be installed.

The Oakdale (Tenn.) Hoisery Mills have been chartered with a capitalization of $10,000 by W. Y. Boswell, B. F. Bingham, S. N. Oakley and associates.

An effort is being made to secure the establishment of a hosiery mill at Dalton, Ga., by Miller Bros., of Chattanooga, Tenn.; $20,000 of stock has been subscribed locally it is said.

Infants' hosiery will be manufactured by the Ashe Hosiery Mills, Knoxville, Tenn., recently incorporated with $25,000 capital. This company has a three-story 125x75-foot building which is being remodeled for the installation of 50 knitting machines, 40 ribbers and 15 loopers, all purchased. It has organized with these officers: J. J. Ashe, president; F. E. Haun, secretary; W. S. McNab, superintendent.

The Comfort Knitting Mills, Newark, N. J., operating a plant for the manufacture of knit goods at 110 Walnut Street, have filed articles of incorporation with a capital of $70,000. F. Strobel, R. E. Babson and S. M. Babson head the company.

The Coaldale Hosiery Company, Coaldale, Pa., has had plans prepared for a three-story, steel and reinforced concrete addition to its plant, 50x99 feet. Wayne M. High, Reading, is architect.

The Carolina Cotton & Woolen Mills, 66 Leonard Street, New York, operating a plant at Spray, N. C., is having preliminary plans prepared for an addition to its mill in the Fieldale section. F. P. Sheldon & Son, Providence, R. I., are engineers for the company.

The Central Hosiery Company, Adamstown, Pa., has been incorporated with a capital of $25,000 to operate a local plant for the manufacture of hosiery and knit goods. Horace L. and Harry K. Stoch and George W. Baliman are the incorporators.

John H. Stringer, 77 Nairn Place, Newark, N. J., and associates are reported to be planning for the establishment of a new knitting mill near Gaffney, S. C.

Rambo & Regar, Norristown, Pa., manufacturers of hosiery, are planning for extensions to their plant to increase the present capacity. The company is said to have acquired the plant of the Bridgeport Knitting Mills, specializing in the manufacture of hosiery, and will operate the mill in connection with its Norristown plant. H. K. Regar is treasurer of the company.

The Wolf & Sons Knitting Company, Jersey City, N. J., has filed notice of organization to operate a plant at 5 Graham Street for the manufacture of knit goods. Jacob and Joseph S. Wolf are heads of the company.

The Amerlin Company, Dover, Del., has been incorporated with a capital of $5,000,000 to manufacture cotton goods and other fabrics. The incorporators are Benjamin F. Mills, Cleveland, O.; F. N. Stearns, New York City; and Henry P. Crowell, Chicago, Ill.

George Brown's Sons, Main Street, Mount Joy, Pa., manufacturers of cotton goods, have completed the erection of an addition to their plant and plan for the immediate installation of machinery to provide increased capacity.

The "D. & G." Company, Reading, Pa., is planning for the erection of a new hosiery mill to cost $30,000.

The Bardenhall Knitting Mills, Philadelphia, Pa., recently organized, have commenced the operation of a plant at 5423-27 Germantown Avenue, for the manufacture of knit goods of various kinds. The initial installation consists of twelve flat knitting machines. George W. Bardens and Thomas E. Hall are heads of the company.

Joseph Black & Sons Company, 1200 North Market Street, York, Pa., has secured an order from the government for hosiery, in which the company specializes, amounting to 72,000 pairs of socks, at a cost of about $13,500.

Walter F. Keefer, Camillus, N. Y., owner of the Middlesex Knitting Mills, died at his home, July 2, at the age of eighty years. He had been proprietor of the plant for the past forty-eight years having started at the works while a young man and working his way to the head of the business. Mr. Keefer was born in North Hoosic, January 31, 1837, and is survived by his widow, two daughters and a brother.

"The Ideal Drive for Textile Machinery" is the title of a thirty-page booklet being distributed by the Link-Belt Company, 39th Street and Stewart Ave., Chicago, Ill. This book describes and illustrates the Link-Belt silent chain drive and its application in the textile industry. This book, and another book published by the Link-Belt Company and known as the Data Book No. 125, form a very complete library of useful facts and suggestions for the cotton mill superintendent. They may be secured without cost by interested readers.

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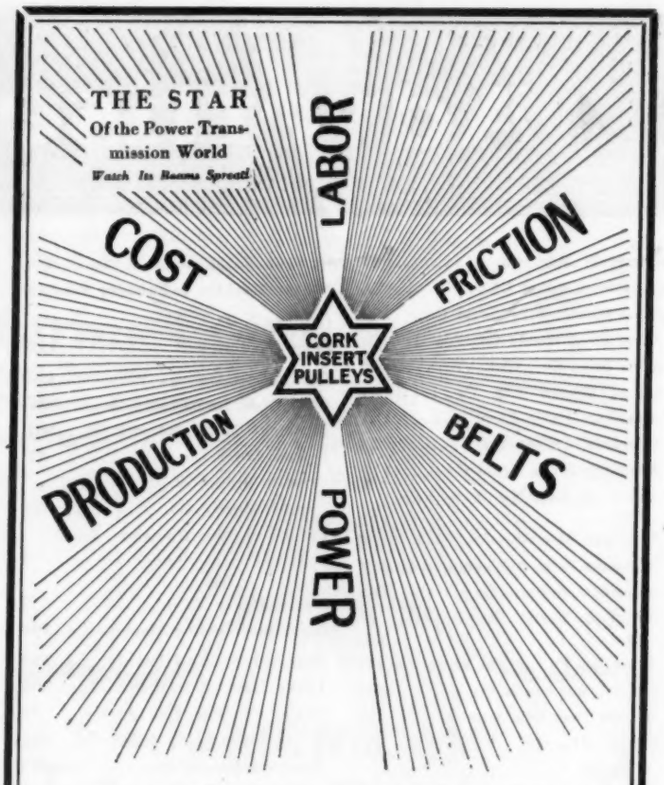

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BUYERS' INDEX—Continued.

Cloth Shrinking Machinery.
Reliance Machine Works.

Cloth Tubes.
(See Tubes—Cloth Protecting.)

Cloth Winders.)
(See Winders.)

Clutches (Friction).
Caldwell Co., W. E.
Cork Insert Co.
Cresson-Morris Co.
Hunter Mch. Co., Jas.
Link-Belt Company.
Seeger-Walraven Co.
Transmission Ball Bearing Co.

Coal & Coke.
Chesapeake & Ohio Coal & Coke Co.

Coal Driers (Centrifugal.)
Link-Belt Company.

Coal Handling Machinery.
Hunt Co., C. W.
Link-Belt Company.

Coal Tar Disinfectants.
(See Disinfectants.)

Cocks.
Lunkenheimer Co.

Colleges.
(See Schools.)

Colors.
(See Dyestuffs and Chemicals.)

Combs.
Loom Reed & Harness Co.

Comb Aprons.
(See Aprons.)

Commission Merchants and Dealers.
(See Cotton Cloth Commission Merchants.)

Compressors (Air).
Allis-Chalmers Mfg. Co.
General Electric Co.
Seeger-Walraven Co.
Taylor Instrument Co.

Concrete Hardener & Reinforcement.
General Fireproofing Co.

Condensers.
Allis-Chalmers Mfg. Co.
Seeger-Walraven Co.

Cones (Paper).
(See Tubes—Cloth Protecting.)

Contractors (Building).
(See Architects and Engineers.)

Contractors (Electrical).
(See Electrical Contractors and Engineers.)

Controlling Instruments.
Taylor Instrument Co.

Conveying Machinery.
Caldwell Co., W. E.
Collins, J. D.
Cresson-Morris Co.
Hunt Co., C. W.
Leigh & Butler.
Link-Belt Company.
Phila. Drying Machinery Co.
Phila. Textile Machy. Co.
Saco-Lowell Shops.
Schofield, Wm. Co.
Seeger-Walraven Co.
Smith & Furbush Mach. Co.

Coolers.
(See Humidifying Apparatus.)

Cooling Towers.
(See Tanks and Towers.)

Copper Stamps and Stencils.
(See Stamps, Stencils, Etc.)

Cordage Machinery.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Cork Insert Pulleys.
(See Pulleys—Cork Insert.)

Cottages (Metal).
Canton Metal Ceiling Co.

Cotton Cloth Commission Merchants and Dealers.
Armory Browne & Co.
Fawcett, Hughes.
Paulson, Linkroum & Co.
Salkeld & Bro. A. D.
Weimer Bros.
Woodward, Baldwin & Co.

Cotton Dealers and Brokers.
Beer, H. & B.

Cotton Machinery.
American Supply Co.
Barber-Colman Co.
Butterworth & Sons, H. W.
Cocker Mch. & Foundry Co.
Crompton & Knowles Loom Wks.
Delahunty Dyeing Machine Co.
Draper Corporation.
Firsching, J. A.
Gordon-Hay Co.
Howard & Bullough.
Hunter Mch. Co., Jas.
Leigh & Butler.
Phila. Drying Mchy. Co.
Phila. Textile Machy. Co
Sargent's Sons, Corp., C. G.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Stafford Co., The
Textile Finishing Machinery Co., The
Whitinsville Spinning Ring Co.

Cotton Yarn Mills.
(See Yarn Manufacturers.)

Coupling—Rope.
Hunt Co., C. W.

Counters (Speed-Measuring).
The Foxboro Company.

Counters—Revolution, Hank, Pick, Etc.
National Scale Co.
Veeder Mfg. Co.

Cranes (Locomotive).
Link-Belt Company.

Crayons.
American Crayon Co.
Dixon Crucible Co.

Crushing Machinery.
Allis-Chalmers Mfg. Co.

Cuspidors.
Baylis Office Equip. Co.

Cutters (Cloth).
(See Cloth Cutters.)

Cutters (Thread).
(See Thread Cutters.)

Cylinder Roll Grinders.
Roy & Son Co., B. S.

Dies (Steel).
(See Stamps, Stencils, Etc.)

Disinfectants.
Barrett Co., The.

Dobby Chains.
Crompton & Knowles Loom Wks.

Doffing Boxes (Mill).
(See Boxes—Mill).

Door Mats (Steel).
Acme Steel Goods Co.

Draft Gauges and Thermometers.
Taylor Instrument Co.

Drawings of Mills.
Shutting Co., R. J.

Drawing Frames.
Howard & Bullough.
Saco-Lowell Shops.

Drills—Electric.
Western Electric Co.
Westinghouse Elec. & Mfg. Co.

Drinking Fountains.
(See Fountains—Drinking.)

Drying Machinery.
Butterworth, H. W. & Sons Co.
Cocker Mch. & Foundry Co.
Hunter Mch. Co., Jas.
Phila. Drying Machy. Co.
Phila. Textile Machy. Co.
Salem Iron Works.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.

Dust Collectors.
(See Blowers and Blowing Systems.)

Dusting Machinery.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Dyers, Bleachers and Finishers.
Aberfoyle Mfg. Co.
Franklin Process Co.
Home Bleach & Dye Works.

Dyeing, Bleaching and Finishing Machinery.
Allen Sons Co., Wm.
American Laundry Mchry. Co., The.
Butterworth & Son Co., H. W.
Cocker Mch. & Foundry Co.
Delahunty Dyeing Machine Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Franklin Process Co.
Hunter Mch. Co., Jas.
Klipstein & Co.
Leigh & Butler
Phila. Drying Machinery Co.
Phila. Textile Machy. Co.
Reliance Machine Works.
Roy & Son Co., B. S.
Salem Iron Works.
Smith, Drum & Co.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Worcester Steam Boiler Works.

Dye Sticks.
Phila. Drying Machinery Co.

Dyestuffs and Chemicals.
Aberfoyle Mfg. Co.
Arabol Mfg. Co.
Baltic Chemical Co.
Bayer Co.
Bosson & Lane.
Brown & Bro., B.
Cone, Frederick H.
Dicks David & Broadfoot, Inc.
Electro Bleaching Gas Co.
Gismond & Co., Inc., Jas. G.
Grasselli Chemical Co.
Holland Aniline Co.
Jordan Jr., W. H. & F.
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Madero Bros.
Marden, Orth & Hastings Co.
Metz & Co., H. A.
Miller, Jos. B.
National Aniline & Chemical Co.
Seydel Mfg. Co.
Sykes & Co., Walter F.
Wolf & Co., Jacques.

Electrical Contractors.
Clayton, J. M.
McKinney, Inc., T. H.
Walker Elec. & Plumbing Co.

Electric Dynamos and Motors.
(See Motors and Generators.)

Electric Fans.
(See Fans—Electric.)

Electric Lamps.
(See Lamps.)

Electrical Machinery and Supplies.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Economy Fuse & Mfg. Co.
General Electric Co.
Lincoln Elec. Co.
Seeger-Walraven Co.
Walsh & Weidner Boiler Co.
Western Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Trucks (Inter-Transportation).
(See Trucks—Electric.)

Electrical Wiring & Installing.
(See Electrical Contractors.)

Elevators
Collins, J. D.
Hunt Co., C. W.
Link-Belt Company.
Seeger-Walraven Co.

Enamel (Mill White)
(See Paint—Mill White).

Engineers, Consulting.
(See Architects.)

Engineers (Electrical).
See Electrical Contractors.

Engines (Oil, Gas and Gasoline).
Seeger-Walraven Co.

Engines (Steam).
Allis-Chalmers Mfg. Co.
Collins, J. D.
Lombard Iron Works & Supply Co.
Schofield's Sons Co., J. S.
Seeger-Walraven Co.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Engine Appliances (Oil & Steam).
Lunkenheimer Co.

Expanders (Cloth).
(See Cloth Expanders.)

Expanded Metal Reinforcement.
General Fireproofing Co.

Extractors—Hydro.
American Laundry Mchy Co. The
Tolhurst Machine Works.

Fans—Electric.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
General Electric Co.
Howard & Morse.
Lincoln Electric Co.
Western Electric Co.
Westinghouse Elec. & Mfg. Co.

Fans—Conveying, Power and Exhaust.
(See Blowers and Blowing Systems.)

Feed Water Purifiers.
(See Walter Softeners.)

Felting Machinery.
Smith & Furbush Mach. Co.

Fence—Steel and Iron.
Anchor Post Iron Works.

Filing Cabinets & Systems.
Baylis Office Equip. Co.
General Fireproofing Co.

Filters (Water).
(See Water Softening.)

Finishing.
(See Dyers, Bleachers and Finishers.)

Finishing and Sizing Materials.
Aberfoyle Mfg. Co.
American Soap & Washoline Co.
Baltic Chemical Co.
Bosson & Lane.
Brown & Bro., B.
Cone, F. H.
Corn Products Refining Co.
Electro Bleaching Gas Co.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Jordan, Jr., W. H. & F.
Kali Mfg. Co.
Klipstein & Co., A.
Madero Bros.
Marden, Orth & Hastings.
Metz & Co., H. A.
National Aniline & Chemical Co.
Seydel Mfg. Co.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

Fire Extinguishers.
Fyr-Fyter Co.
Missouri Lamp & Mfg. Co.
Pyrene Mfg. Co.

Fire Hose.
(See Hose—Fire).

Fire Protecting Paint.
(See Paint—Fireproof.)

First Aid Room Equipment.
(See Hospital Equipment.)

Fluted Rolls.
Howard & Bullough.
Saco-Lowell Shops.
Schofield's Sons Co., J. S.
Smith & Furbush Machine Co.
Southern Spindle & Flyer Co.

Flyers.
Howard & Bullough.
Leigh & Butler.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.

Folding Machines (Cloth).
Windle, J. E.

Fountains—Drinking.
Manufacturers Equip. & Eng. Co.
Rundle-Spence Co.

Friction Clutches.
(See Clutches—Friction.)

Fulling Mills for Woolen Goods.
American Laundry Mchy. Co.
Hunter Machine Co., Jas.

Furniture—Office and Mill.
Baylis Office Equip. Co.
General Fireproofing Co.

Fuses.
Carter Electric Co.
Economy Fuse & Mfg. Co.
General Elec. Co.
Western Electric Co.

Garnett Grinders.
Roy & Son Co., B. S.

Garages (Metal Portable).
Canton Metal Ceiling Co.
General Fireproofing Co.

Garnett Machines.
Hunter Mch. Co., Jas.
Leigh & Butler.
Smith & Furbush Mach. Co.

Gas Engines.
(See Engines—Gas.)

Gaskets—Fibre.
Diamond State Fibre Co.

Gauge Cocks.
Lunkenheimer Co.

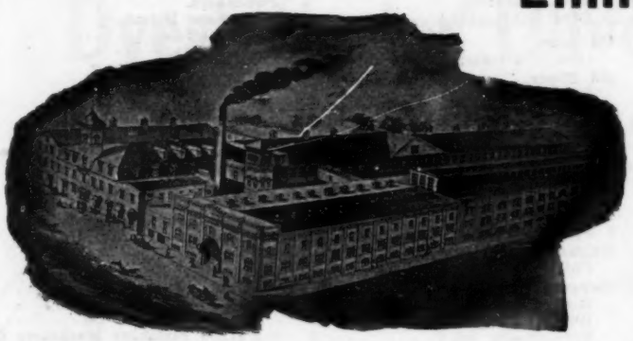
Gauges (Draft).
Taylor Instrument Co.

Gauges (Mercury Column Vacuum)
Taylor Instrument Co.

Gauges (Mercury Column Absolute Pressure).
Taylor Instrument Co.

Gauges (Oil).
Lunkenheimer Co.

Gauges (Water).
Lunkenheimer Co.



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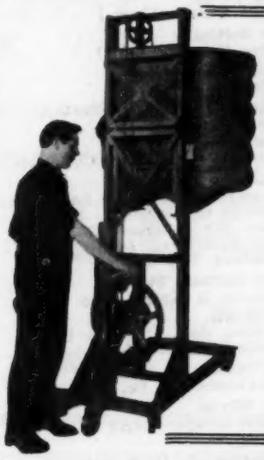

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BUYERS' INDEX—Continued.

Gears (Silent).
Diamond State Fibre Co.
General Electric Co.
Western Electric Co.

Gear Cutters.
Cresson-Morris Co.
Whiton Mch. Co., D. E.

Generators (Electric).
(See Motors and Generators.)

Glass (Wire).
Mississippi Wire Glass Co.

Grain Bags.
American Supply Co.

Grates—Shaking.
Collins, J. D.
Lombard Fdy. & Mch. Co.

Grease.
(See Lubricants.)

Grease Cups.
(See Lubricators.)

Grinders—Card, Cylinder Roll, Napper and Garnett.
(See Card Grinding Machinery.)

Gummed Tape and Moistening Machine for Slashers.
Acme Gummed Products Co.

Gums.
(See Finishing and Sizing Materials.)

Hangers.
(See Shafting and Hangers.)

Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Garland Mfg. Co.
Loom Reed & Harness Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus.)

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.

Heddle Frames.
Crompton & Knowles Loom Wks.

Hoist (Electric).
Link-Belt Company.
Seeger-Walraven Co.

Hosiery Finishing Boards.
(See Boards.)

Hospital Equipment.
Accident Cabinet Co.
Betz, Frank S.

Hotels.
Lenox.
Marquette.
Marseilles.
Martinique.
Tuller.

Humidifying Apparatus.
Carrier Eng. Corp.
Cramer, Stuart W.

Hydraulic Turbines.
(See Turbines Steam.)

Hydro Extractors.
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Hygrometers.
The Foxboro Company.

Indicating Instruments.
Taylor Instrument Co.

Indicating and Recording Instruments.
The Foxboro Company.

Indigo.
(See Dyestuffs and Chemicals.)

Injectors.
Lunkenheimer Co.

Ink (Stencil and Marking).
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lindley Ink Co., Dr. R. A.

Ink—Writing.
Baylis Office Equip. Co.

Iron Work—Ornamental.
Anchor Post Iron Works.
Dufur & Co.
Salem Iron Works.

Jacquards.
Crompton & Knowles Loom Wks.

Jute Bagging Machines.
Smith & Furbush Mach. Co.

Kettles (Size).
(See Size Kettles.)

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleaching Kiers.)

Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers.)

Knit Goods Washers.
(See Washers—Cloth.)

Knitting Machinery.
Boss Knitting Mach. Works.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Nye & Tredick Co.
Scott & Williams.
Stafford & Holt.
Smith & Furbush Mach. Co.
Wildman Mfg. Co.

Labels (Printed).
Pennebaker-Turley.

Lace Leather.
Graton & Knight Mfg. Co.

Lamps—Incandescent and Arc.
Boston Economy Lamp Div.
Carter Electric Co.
General Electric Co.
Western Electric Co.
Westinghouse Electric & Mfg. Co.
Westinghouse Lamp Co.

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.

Laundry Machinery.
American Laundry Mach. Co., The
Tolhurst Machine Works.

Lockers (Metal)
Baylis Office Equipment Co.

Leather Belting.
(See Belting—Leather.)

Linen Yarns.
(See Yarns—Linen.)

Link Belting.
(See Belting—Link.)

Liquid Chlorine.
(See Chlorine.)

Loaders (Wagon and Truck).
Link-Belt Company.

Logwood Extract.
(See Dyestuffs and Chemicals.)

Looms.
Crompton & Knowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield, Wm. & Co.
Stafford Co., The

Loom Harness Straps.
Graton & Knight Mfg. Co.

Lubricants.
Dixon, Jos., Crucible Co.
Kellogg & Co., E. H.

Lubricators.
Lunkenheimer Co.

Lug Straps.
(See Straps—Lug.)

Lumber.
Salkeld, A. D. & Bro.

Marking Pots, Stencils, Ink, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

Measuring Machine (Cloth).
Windle, J. E.

Mercerized Yarns.
(See Yarns Mercerized.)

Mercerizers.
Aberfoyle Mfg. Co.
Home Bleach & Dye Works.

Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Wolf & Co., Jacques.

Metal Ceilings, Etc.
Canton Metal Ceiling Co.
General Fireproofing Co.

Meters (Revolution).
The Foxboro Co.

Meters (Flow, Air, Gas, Electric, Steam, Etc.)
Allis-Chalmers Mfg. Co.
Carter Electric Co.
The Foxboro Co.
General Electric Co.
Lincoln Electric Co.
Western Electric Co.
Westinghouse Elec. & Mfg. Co.

Mill Baskets and Boxes.
(See Boxes—Mill.)

Mill Engineer.
(See Architects and Engineers).

Mill White Paint.
(See Paint—Mill White.)

Millwrights.
Hunter Mch. Co., Jas.

Motors and Generators (Electric).
Allis-Chalmers Mfg. Co.
Carter Electric Co.
General Electric Co
Lincoln Electric Co.
Seeger-Walraven Co.
Western Electric Co.
Westinghouse Elec. & Mfg. Co.

Mule Stands.
Transmission Ball Bearing Co.

Napper Grinders.
Roy & Son, B. S.

Napping Machinery.
Leigh & Butler.

Office Supplies, Furniture, Etc.
Baylis Office Equip. Co.
General Fireproofing Co.

Oils—Finishing.
(See Finishing and Sizing Materials.)

Oils—Lubricating.
(See Lubricants.)

Oil Cups.
(See Lubricators).

Oil Paper.
Bradley Mfg. Co., A. J.

Oiling Devices.
(See Lubricators).

Openers for Cotton, Wool, Waste Etc.
Leigh & Butler.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Oxidizing Machinery.
Phila. Drying Machinery Co.

Oxygen.
Bird Wilcox Co.
Burdett Oxygen Co.
Prest-O-Lite Co.

Packings—Leather.
Graton & Knight Mfg. Co.

Paint.
Arco Co.
Barrett Co., The.
Certain-teed Products Corp.
Chaffee, Thos. K.
General Fireproofing Co.
Ullman-Philpott Co.
Wadsworth-Howland & Co., Inc.

Paint—Preservative and Fireproof.
Arco Co.
Certain-teed Products Corp.
General Fireproofing Co.
Wadsworth-Howland & Co., Inc.

Paint—Mill White.
Arco Co.
Chaffee, Thos. K.
General Fireproofing Co.
Ullman-Philpott Co.
Wadsworth-Howland & Co., Inc.

Paper (Oil).
Bradley Mfg. Co., A. J.

Perforated Metal.
(See Screens and Sieves.)

Photographer of Mills.
Shutting Co., Rudolph J.

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Pickers—Curled Hair.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.

Picker Housings.
Hubbard Mch. Co.

Pickers—Leather.
Garland Mfg. Co.
Graton & Knight Mfg. Co.

Picker Sticks.
Garland Mfg. Co.

Pipe Fittings.
Lunkenheimer Co.

Pipe Threading & Cutting Machines
Seeger-Walraven Co.

Power Companies.
(See Central Stations.)

Power Transmission.
Allis-Chalmers Mfg. Co.
Arguto Oilless Bearing Co.
Bound Brook Oil-less Bearing Co
Caldwell Co., W. E.
Cork Insert Co.
Cresson-Morris Co.
Freadrich Belting Co.
General Electric Co
Graton & Knight Mfg Co.
Hunter Machine Co., Jas.
Link-Belt Company.
Seeger-Walraven Co.
S K F Ball Bearing Co.
Textile Specialty Co.
Transmission Ball Bearing Co.
Western Electric Co.
Westinghouse Electric & Mfg. Co.

Press Papers.
Diamond State Fibre Co.
Phila. Drying Machinery Co.

Presses.
American Laundry Mchy. Co. The
Butterworth & Sons Co., H. W.
Economy Baler Co.
Phila. Drying Machinery Co.
Reliance Machine Works.
Seeger-Walraven Co.
Smith, Drum & Co.
Smith & Furbush Mch. Co.
Textile Finishing Machinery Co. The

Printed Forms, Time Books, Bands, Labels, Tickets, Etc.
Pennebaker-Turley.

Publishers.
Literary Digest.
rials.)

Pulleys.
Caldwell Co., W. E.
Cork Insert Co.
Cresson-Morris Co.
Link-Belt Company.
Seeger-Walraven Co.
Transmission Ball Bearing Co.

Pulleys (Cork Insert).
Cork Insert Co.

Pulley Covering.
Freaderich Belting Co.
Graton & Knight Mfg. Co.

Pumps.
Allis-Chalmers Mfg. Co.
Collins, J. D.
Reilly Mfg. Co., J. J.
Seeger-Walraven Co.
Textile Finishing Machinery Co., The
Toomey, Frank.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

Pyrometers.
Taylor Instrument Co.

Racks—Metal.
Manufacturers Equip. & Eng. Co.

Railings.
Dufur & Co.

Railways—Industrial.
(See Trucks—Electric.)

Railways.
Central of Ga. Railway.
Southern Railway.

Recording Instruments.
Taylor Instrument Co.
The Foxboro Company.

Reeds.
American Supply Co.
Emmons Loom Harness Co.
Loom Reed & Harness Co.

Reels.
Crompton & Knowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield Co., Wm.

Regulators (Pressure).
Taylor Instrument Co.

Regulators (Temperature).
Taylor Instrument Co.

Reinforcement (Steel).
General Fireproofing Co.

Repairing (Textile of all kinds).
General Machine Works.
Hubbard Mch. Co.

Rewinding Machines.
Windle, J. E.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

Ring Travelers—Steel and Bronze.
Whitinsville Spinning Ring Co.

Rings—Spinning.
(See Spinning Rings.)

Rocker Shaft Bearings.
(See Bearings.)

Rolls—Steel.
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Roller Covering.
Graton & Knight Mfg. Co.

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Certain-teed Products Corp.
Cortright Metal Roofing Co.
General Fireproofing Co.

Roof and Cement Coating.
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General Fireproofing Co.
Wadsworth, Howland & Co., Inc.

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Caldwell Co., W. E.

Rope—Transmission
Caldwell Co., W. E.
Cresson-Morris Co.
Hunt Co., C. W., Inc.
Hunter Mch. Co., Jas.
Link-Belt Company.

Roving Cans & Trucks.
(See Cans—Roving.)

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.

Rubber Stamps.
(See Stamps, Stencils, Etc.)

Saddles and Stirrups.
Dixon Lub. Saddle Co.

Saddles—Oil-less.
Bound Brook Oil-less Bearing Co.

Sash-Window (Steel.)
General Fireproofing Co.
Lupton's Sons Co., David.

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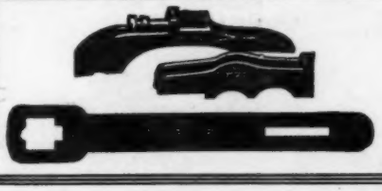

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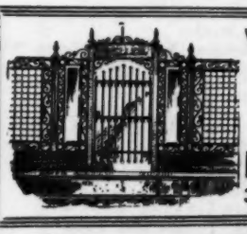

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Merrow Machine Co., The.
Textile Finishing Mchy. Co.
Willcox & Gibbs Sewing Mch. Co.

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Caldwell Co., W. E.
Cresson-Morris Co.
S K F Ball Bearing Co.
Seeger-Walraven Co.
Transmission Ball Bearing Co.

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Graton & Knight Mfg. Co.

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Canton Metal Ceiling Co.
General Fireproofing Co.
Lupton's Sons Co., David.
National Scale Co.

Shingles (Asphalt).
Certain-teed Products Corp.

Shingles—Metal.
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Cortright Metal Roofing Co.

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Draper Corporation.
Shambow Shuttle Co.

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Butterworth & Sons Co., H. W
Phila. Drying Machinery Co.
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Textile Finishing Machinery Co., The.

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Allen Sons Co., Wm.
Butterworth, H. W. & Sons Co.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.
Worcester Steam Boiler Wks.

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Seydel Mfg. Co.
Wolf & Co., Jacques.

Skewers.
Jordan Mfg. Co.

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Lupton's Sons, Co., David.

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Butterworth & Sons Co., H. W.
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Salem Iron Works.
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Softeners—Water.
(See Water Softeners.)

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(See Tanks, Towers, Etc.)

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Link-Belt Company.

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Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.

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(See Tanks, Towers, Etc.)

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(See Finishing and Sizing Materials.)

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(See Engines—Steam.)

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(See Hose—Steam.)

Steam Pumps.
(See Pumps—Steam.)

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(See Traps—Steam.)

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(See Stamps and Stencils.

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(See Marking Pots and Brushes.)

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(See Stamps and Stencils.)

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Draper Corporation,
Wildman Mfg. Co.

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Freadrich Belting Co.
Graton & Knight Mfg. Co.

Tacohmeters.
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Veeder Mfg. Co.

Tallow.
(See Finishing Material.)

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The Foxboro Company.

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Draper Corporation.

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Collins, J. D.

Toilets.
Cement Products Co.
Selig Co., The
Vogel Co., Jos. A.

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(See Tanks and Towers.)

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(See Power Transmission Machinery.)

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White Co., The

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(See Cooling.)

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Stafford Co., The
Windle, J. E.

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(See Glass—Wire.)

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(See Electrical Contractors).

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Schofield Co., Wm.
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Phila. Textile Machinery Co.
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Smith & Furbush Mach. Co.
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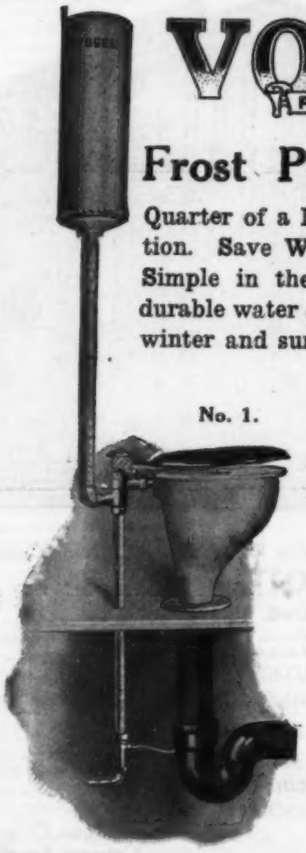

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Why Pay More Than $3.00 For a Sanitary Closet

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You need no running water—no plumbing—no fixtures—no "expert" high priced labor to install the

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THE STEVENS CAN IS AN ECONOMY IN YOUR MILL VILLAGE IF YOU WILL USE IT and IT alone—without screens, vaults, or special equipment or buildings. It is GUARANTEED FLY PROOF AND SANITARY.

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A postal will bring proofs of our statements, or a trial shipment of Stevens Cans. Write today.

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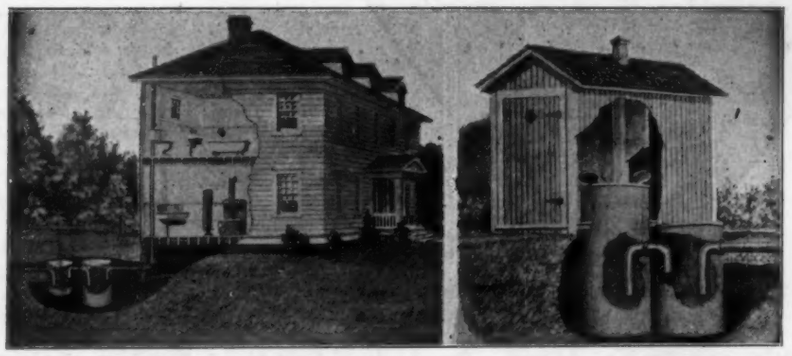

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W. R. C. SMITH PUBLISHING COMPANY

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POSITION WANTED—As overseer of Spinning or Twisting, by a man with 13 years' experience in cotton mills, 9 years as overseer of spinning. Is 37 years old and married. Experience has been all on heavy yarns for the manufacture of heavy ducks. Familiar with Saco-Lowell and Howard & Bullough machinery. Is at present employed, but would be interested in a better position and could accept it on 10 days notice. Does not care to go outside of Georgia. Address Box 368, care COTTON.

POSITION WANTED as superintendent or manager. A man with wide experience, over 20 years in many large Northern mills, desires position, preferably in the South. Experienced on all kinds of plain and fancy goods, cotton, silk, linen, and some wool. Have acted as purchasing agent for a number of concerns and have taken charge of the erection and organization of mills for both fine and coarse yarns, combed and carded. Capable of doing designing where necessary. Familiar with all kinds of machinery and power plants. Very best of references exchanged. Address Box 312, care COTTON.

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POSITION WANTED as Overseer of Spinning or Twisting, in some Georgia mill. Have had 13 years experience on all heavy duck, and with Saco-Lowell, H. & B. and other machinery. Good references. Married and 37 years of age. Address Box 97, care COTTON.

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For Sale.

NOTICE TO MILL INVESTORS

The mills of the Paulding County Cotton Manufacturing Company as a going concern, with all equipment and appurtenances will be sold at bankrupt sale on September 4th, on the premises at Dallas, Georgia, free of all liens. About 7,000 spindles. For particulars apply to

L. R. ADAMS.
Trustee in Bankruptcy,
214 Healey Building, Atlanta.

For Sale

Three model 6, 100 spindle Foster Winders, second hand, but now in use and can be seen running. Do good work on numbers 4's to 14's. Reason for wishing to sell, going on to finer numbers. Tubing spindles can be attached. Will sell cheap and give early delivery. Address, Kinston Cotton Mills, Kinston, North Carolina.

CHEESE-CLOTH MANUFACTURERS

should write, indicating their ability to handle orders on 22 x 18 cheese-cloth for a concern using large quantities. Address Box 29, care COTTON.

WANTED
Children's Hosiery.

An inquiry has been received for 1.000 cases of children's ribbed hose in sizes 5 to 10, at a price of 85 cents to 87½ cents a dozen. Any mill in a position to consider a proposition of this character should communicate with Box 28, care COTTON.

Used Machines For Sale

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One 20″ x 12′ Lathe.
One 32″ x 12′ Lathe.
Two 16″ x 10′ Lathe.
One 16″ x 8′ Lathe.
One 24″ Aurora Drill Press with tapping attachment.
One new 1½″ Single Head Landis Bolt Cutter.
New Marvel Power Hack Saws in stock for immediate delivery.
We can equip you in either new or used machinery. Write us.

Seeger-Walraven Company
Machinery and Mill Supplies.
38 W. Alabama St., Atlanta, Ga.

New and Second Hand

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Corliss Automatic and Slide Valve

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Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

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WOOD WORKING

Planers, Molders, Band Saws, etc.

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Dynamos and Motors

AND SUPPLIES OF ALL KINDS

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Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Etc.

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MANUFACTURERS OF
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OUTING FLANNEL AND ROMPER CLOTH
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LINEN YARNS
For Weaving, Knitting and all Purposes
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And Every Description of Linen Thread and Twine
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QUALITY YARNS

The Best That Nature and Manufacturing Skill Can Produce.

This Label Insures Supreme Quality

Quality Knitters quickly discriminate between true yarn quality and its imitation—that's the reason they *are* Quality Knitters, and that's the reason they demand

"GRAY DAWN" QUALITY YARNS

the yarn that is made to a standard, always the same, uniform, clear and even—made from the best Combed Peeler Cotton that money can buy.

We are so proud of our product that we place the above trade-mark on every bale or other package so that you may know you are getting the true quality yarn.

Write for samples and prices.

Gray Manufacturing Co.
Gastonia, - - North Carolina
131 East 23rd Street, New York City.

Have You Complete Confidence in Your Product?

When you weave your product with "Parkdale" Fine Combed Peeler Yarn, you have the satisfaction of knowing that the raw material cannot be surpassed by any fine combed yarn on the market.

"Parkdale" F. C. P. Yarns

give you complete confidence in your product. They are made from the finest combed peeler cotton that can be bought anywhere, and this, together with the most modern methods of production used in their manufacture, assures you a yarn that cannot be improved upon in quality, value and service. Made in 50s to 80s single and ply.

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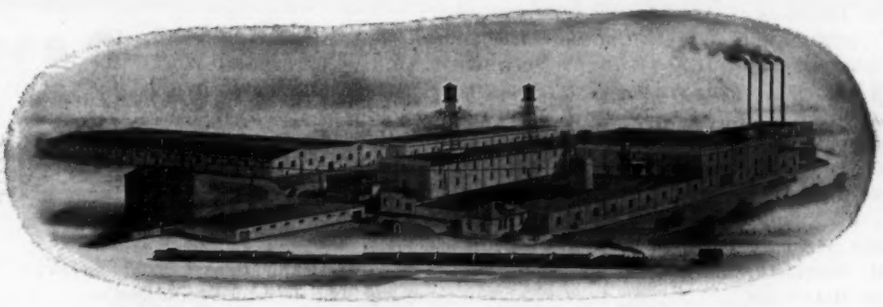

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The Weaver's Friend

It boils thin—penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAS. H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

Announcement

The amalgamation of the coal-tar color, intermediate and raw material manufacturing concerns, comprising

SCHOELLKOPF ANILINE & CHEMICAL WORKS, INC.
W. BECKERS ANILINE & CHEMICAL WORKS, INC.
NATIONAL ANILINE & CHEMICAL CO.
BENZOL PRODUCTS CO.

and certain plants and properties of

GENERAL CHEMICAL CO.
THE BARRETT CO.
SEMET-SOLVAY CO

which pertain to this line, has now been accomplished, and the new Company, known as the **NATIONAL ANILINE & CHEMICAL CO., INC.**, will now continue the business under one organization.

The Officers of the Company are as follows:

WM. H. NICHOLS, Chairman of the Board.
J. F. SCHOELLKOPF, President.
W. BECKERS, 1st Vice President.
I. F. STONE, 2nd Vice President and Treasurer.
C. P. HUGO SCHOELLKOPF, 3rd Vice President.
WM. T. MILLER, Secretary.

The Directors of the Company are as follows:

J. F. SCHOELLKOPF,	of the	Schoellkopf Aniline & Chemical Works, Inc.
J. F. SCHOELLKOPF, JR.,	" "	Schoellkopf Aniline & Chemical Works, Inc.
C. P. HUGO SCHOELLKOPF,	" "	Schoellkopf Aniline & Chemical Works, Inc.
W. BECKERS,	" "	W. Beckers Aniline & Chemical Works, Inc.
EUGENE MEYER, JR.,	" "	W. Beckers Aniline & Chemical Works, Inc.
CHAS. J. THURNAUER,	" "	W. Beckers Aniline & Chemical Works, Inc.
I. F. STONE,	" "	National Aniline & Chemical Co.
WM. H. NICHOLS,	" "	General Chemical Co.
HENRY WIGGLESWORTH,	" "	General Chemical Co. and Benzol Products Co.
J. M. GOETCHIUS,	" "	General Chemical Co. and Benzol Products Co.
T. M. RIANHARD,	" "	Barrett Company and Benzol Products Co.
W. N. MCILRAVY,	" "	Barrett Company and Benzol Products Co.
H. H. S. HANDY,	" "	Semet-Solvay Co. and Benzol Products Co.
E. L. PIERCE,	" "	Semet-Solvay Co. and Benzol Products Co.

The object of the new Company is to insure the **national independence** of the United States in the coal-tar products industry and the aim of the management is to manufacture coal-tar dyes and intermediates which can compete successfully, both in **quality** and **variety**, with those heretofore imported.

As the constituent units of the new Company include manufacturers of raw materials, of intermediates, and of coal-tar dyes, the National Aniline & Chemical Company, Inc., in one organization covers the industry from raw material to finished product.

The offices of the Company will be at 244 Madison Avenue (corner 38th Street), New York City, about Aug. 1, 1917.

NATIONAL ANILINE & CHEMICAL CO., INC.

MADE IN U. S. A.

HOLLAND ANILINE CO.

SALES OFFICES AND WORKS,

HOLLAND, MICH.

Export Trade Solicited.
Pede-se correspondencia com qualquer paiz.
Se solicita correspondencia con todos paizes.

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METHYL VIOLET B

METHYLENE BLUE BB

BISMARK BROWN Y and R

BLUE B, BB, R, RR

SULPHOBISTRE EX. CONC.

CONCENTRATION

Caustic Soda	Cocoanut Oil
Soda Ash	Olive Oil
Caustic Potash	Olive Oil Foots
Aniline Oil	Palm Oil
Carbonate of Potash	Soya Bean Oil
Bichromates	Castor Oil
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James A. Branegan
One of America's Leading Chemists Says

in an article relative to the American Dye Industry published in the "Public Ledger" of Philadelphia, the following:

"Not only have we crossed the tape in the dyestuff line, but we have actually gone ahead in the working of vegetable oils (another branch of organic chemistry). Before the war all high grade soluble oils for textile work were made from castor oil, mostly from Germany, and known as monopole oils (a German patent), or made in this country from imported castor oil. Today one Philadelphia concern is making a hydroxy oil which is made on an American process from American oils exclusively and is superior to the heretofore imported product."

KALI HYDROXY OIL

Made from American Oils on an American Process

is Guaranteed to contain no Castor Oil. It dissolves clear in water and makes no emulsion. For kiering or wetting out before mercerizing or bleaching it is unsurpassed. Permits lye to penetrate and produce even mercerization and a better bleach. For soaking silk before winding, boiling off and finishing, and in the dye bath, etc.

Write today for full information

KMC TRADE MARK KALI

Kali Manufacturing Co.

1406-10 N. Front St., Philadelphia

MANUFACTURERS OF

Kali Neutralizer to prevent tender bleached goods
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"AMERICAN DYES FOR AMERICAN DYERS"

KHAKI NO. 2 FOR COTTON

(Fulfilling All Government Requirements)

DIRECT BLUE N
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Anti-Chlorine Bleaching Process

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Simple
Scientific
Safe

BOSSON & LANE

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MILL SUPPLIES

Caustic Soda, Soda Ash,
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Chlorates, Bichromates,
Chloride of Lime, Cocoanut Oil,
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Aniline Dyes
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Textile Chemicals

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SODIUM SULPHIDE

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Starch

Eagle Finishing

The experience of critical operators has shown this popular brand to be the most efficient sizing agent both for additional *weight* and increased *strength* of warp. Penetration accomplishes these important results.

EAGLE FINISHING is specially manufactured to cover a wide range of fluidities to meet the needs of all classes of weaves.

EAGLE FINISHING penetrates.

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Southern Office, *Greenville, S. C.*

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BICHROMATE OF SODA
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We claim that the guaranteed uniform high quality of our soap and our constant watchfulness to maintain the efficiency of our service entitles us to your consideration when deciding

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The Warren Soap Mfg. Co.
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We Specialize in

Bi-Chromate Soda	Chloride Lime
Chlorate Soda	Bluestone 99%
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Prices—*Exceptional.* Service—*Surpassing.*

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Indigo Extract
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For Cotton and Wool Dyeing.

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Write for samples and prices

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ESTABLISHED 1880

Manufacturers of Textile and Mining Machinery

Revolving Cylinder Raw Stock Dyeing and Bleaching Machines
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Cotton Warp on Beams, 1 to 12 Beams in One Operation

Special Machines for Aniline, Sulphur, Indigo, and Other Vat Colors

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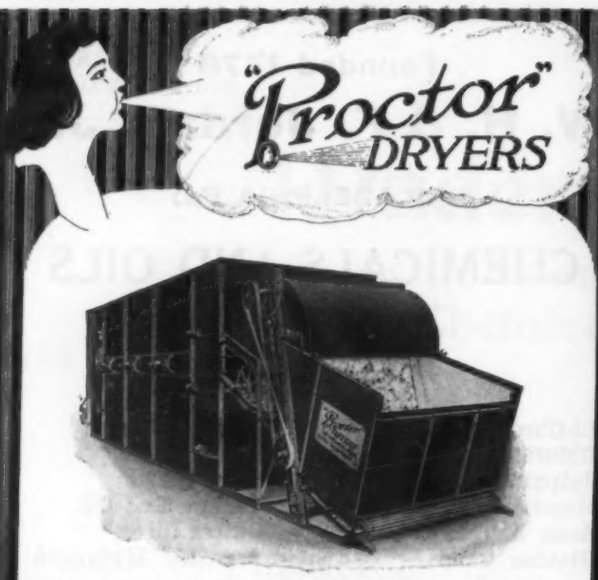

The "Proctor" Automatic Dryer for raw stock with 3-conveyors (one above the other) dries as much as a single conveyor machine nearly three times as long and requires no more power.

When you consider, that our age makes us the oldest and the demand for "Proctor" dryers makes us the largest dryer specialists in America, don't you feel that there may be something very worth while in our product and our service?

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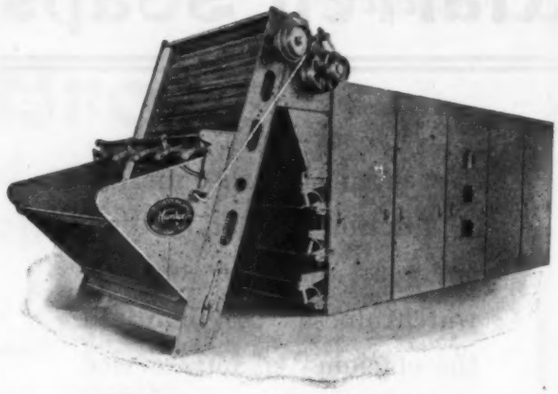

The Hunter **Agitating Table Dryer**

No matter from which viewpoint you regard this Dryer, you will find that it is practical. Instantly you will recognize that experts planned it and master hands directed its construction. There is nothing about it that suggests an experiment—every feature impresses you with the fact that unless its merit had been demonstrated it would not be there. Write for Bulletin which explains everything in detail.

James Hunter Machine Co.
North Adams, Mass.

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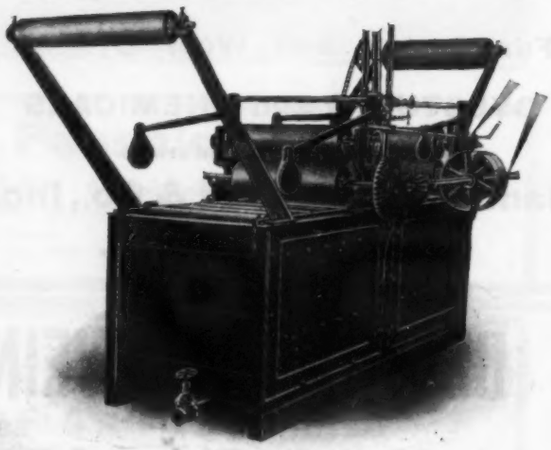
Two Compartment
WARP DYEING MACHINE

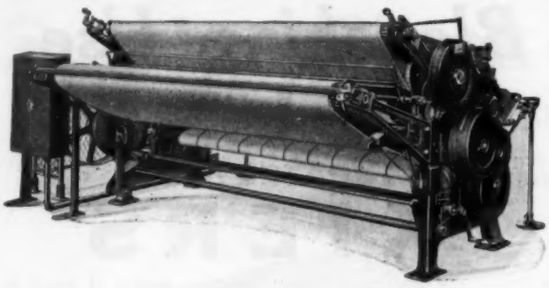


OUR Warp Dyeing Machines are made with any number of compartments, with boxes of all iron construction or combination iron frame cyprus lined boxes. Immersion rollers easily raised or removed.

We also manufacture Warping Machinery, Beaming Machinery, and Dye-House Machinery of all kinds.

Write today for full information and prices.

Cocker Machine & Foundry Co.
Builders of Textile Machinery
GASTONIA, N. C.



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Prices of labor, of materials, of everything the American mill operator buys, have been going up.

This rise in the general American price level must somehow be corrected if foreign competition is to be met after the war.

The American Rotary Hosiery Press will help. It cuts labor cost on the work it does 20 per cent.

Hosiery flows through it at the rate of 3,000 dozen pairs a day when four operators are employed.

In one mill it is saving $144.00 a week in wages.

Let us tell you more.

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Specialty Department
CINCINNATI, - - - OHIO

H. G. MAYER, Southern Textile Agent
Realty Building, Charlotte, N. C.

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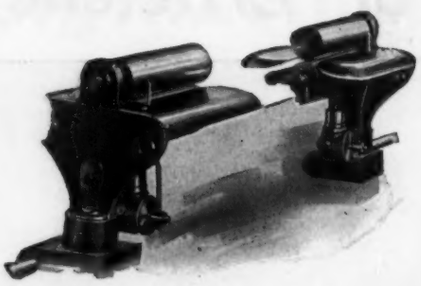

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The "Foxwell" Guider and Feeder saves one operative with each finishing machine to which it is attached.

Write for illustrated catalog of this automatic device, describing many of its innumerable uses.

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Established 1820

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FINISHING
Butterworth
MACHINERY

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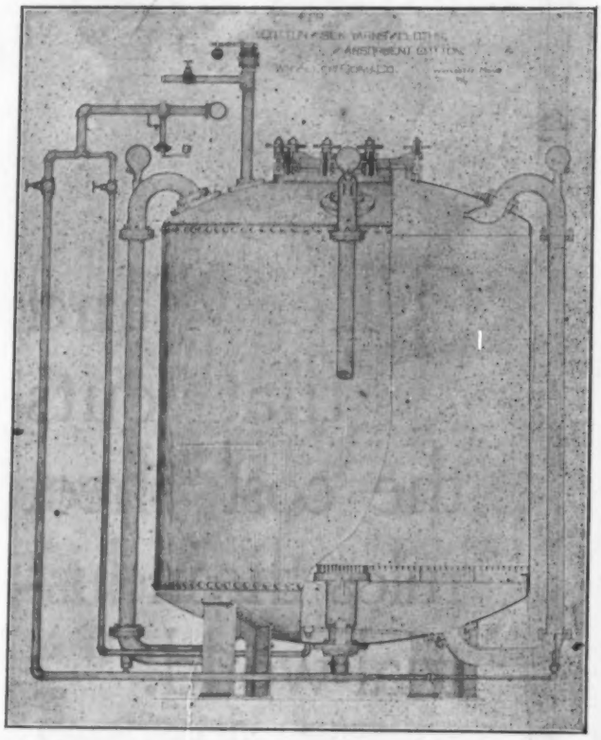
FINISHING MACHINERY

For Efficiency in Bleaching Use



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The "ALLEN INJECTOR" KIER, a sketch of which is shown, is one of the finest injector kiers made. It gives excellent results, has a strong and rapid circulation and is very economical in use of steam.

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"ALLEN WORCESTER" KIER. This is the kier which is becoming so popular. It is replacing scores of other types having proved its efficiency and economy in the finest mills in the country. The New "Worcester" Kier is mechanically correct. A rapid and positive circulation is supplied by the motor or steam driven pump and an unvarying strength of liquor maintained throughout the boil.

No live steam is admitted to the kier. With this kier it is possible to make enormous savings in steam, labor, fuel, chemicals and water; and the results are always absolutely uniform and up to the finest requirements.

Investigate the possibilities of improving your plant. Let us show how the Allen Kiers will increase your bleach room efficiency.

We also manufacture The Allen Improved LOGWOOD EXTRACTOR for extracting the coloring matter from Logwood Chips, and a complete line of CAUSTIC MIXING TANKS and STEAM BOXES and will be very pleased to give full particulars concerning them. Let us hear from you if you are at all interested in such equipment.

Worcester Steam Boiler Works
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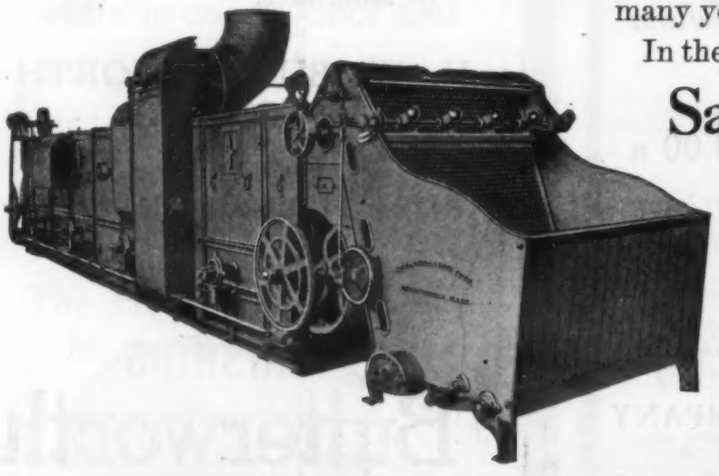
SARGENT DRYERS mark progress in Dryer Development comparable to that made in other fields of mechanical endeavor.

They are favored with a natural preference because they are designed on basic principles of air circulation, conveying, and general drying apparatus construction, which have had the approval of discriminating mill men and drying engineers for many years.



In the

Sargent Dryer

these principles have been combined and refined, making a complete machine which is unexcelled.

For drying cotton, linters, wool, hair, flax and other classes of raw material.

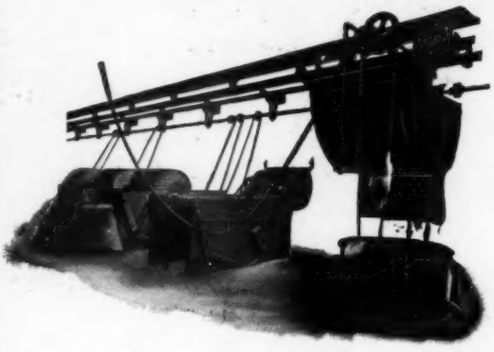
C. G. SARGENT SONS Corp., GRANITEVILLE, MASS.

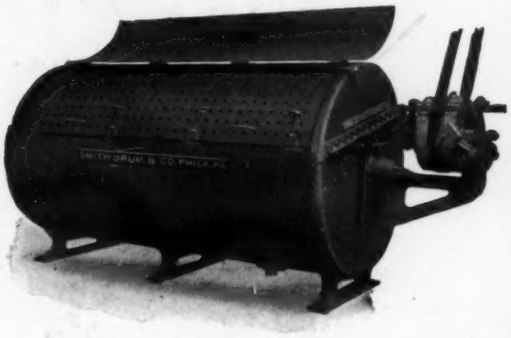
FRED H. WHITE, Southern Agent, Charlotte, N. C.

Sulphur Black Dyeing Machines

Capacities from 50 to 500 lbs. per batch.

CIRCULATING AND ROTARY TYPES





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TEXTILE FABRICS AND WARPS

Kiers.
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Calenders.
Hydraulic
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50 Foot Straightaway Tenter with Patent Automatic Clips

The Textile-Finishing Machinery Co.,

PROVIDENCE, R. I.

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Atlantic Dyestuff Company

MANUFACTURERS OF

SULPHUR BLACK

(Powder of uniform strength—no paste)

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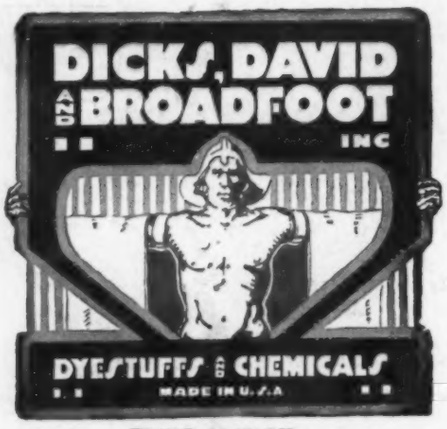

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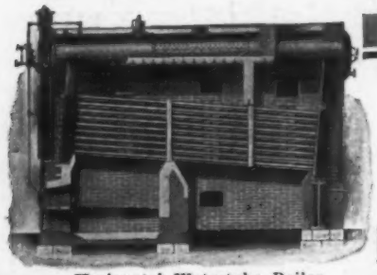

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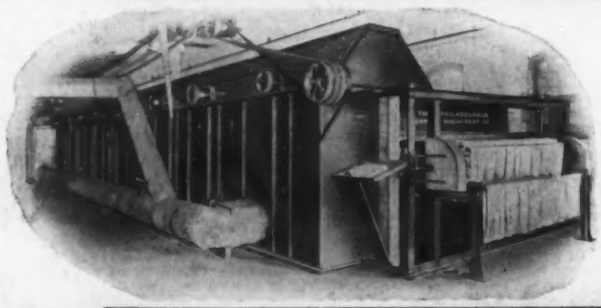

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